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ABSTRACT

The Career Data Book presents data from tests and inventories administered to 108,000 individuals in a five-year followup to Project Talent, a longitudinal study whose goal is to relate the aptitudes, interests, and education of American youth to their occupational choices. The Project conducts periodic surveys on members of the sample over a 20-year period. This book is a practical resource book for counselors in career planning, providing information on the characteristics of the students while they were in high school and on the occupations they have chosen five years later, enabling the counselors to determine to what extent a particular student matches the typical members of an occupation, or group of occupations. Most of the 400 pages consist of objective data presented in the form of profiles of student interests, knowledge, abilities, and other variables. The 138 occupations chosen or entered by the students are organized into twelve career groups. A general description of the characteristics of each group is provided together with a profile combining and comparing the data in all occupations within the group. For each occupation, its characteristics and the characteristics of its members are specified. (AG)

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THE CAREER DATA BOOK:

RESULTS FROM PROJECT TALENT'S FIVE-YEAR FOLLOW-UP STUDY

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1973

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Announcing the publication of

THE CAREER DATA BOOK:

Results from Project TALENT's Five-Year Follow-Up Study

A new 400-page resource book for counselors with detailed descriptions of the interests, acquired information, abilities, and background characteristics of 108,000 high school students who five years after high school planned careers in 138 different occupations

John C. Flanagan
David V. Tiedeman
Mary B. Willis
Donald H. McLaughlin

American Institutes for Research
Palo Alto, California

THE CAREER DATA BOOK--now students can be shown what careers students who were very similar to themselves were entering five years after completing high school. 138 occupations, arranged in 12 groups, are described by profiles of 38 of the most discriminating variables selected from the 109 included in the 1960 Project TALENT survey; these variables include interests, acquired information, abilities, and background characteristics and are based on follow-up studies of more than 108,000 high school students.

The Project TALENT national survey has been supported through the last 15 years by grants from the United States Office of Education and the National Institute of Education; a reprint further describing the work of Project TALENT has been enclosed.

On the following page one description and profile (for Counselor--Vocational and Educational) is presented in a 50% reduction of its actual size. The vertical bars (▮) mark the average percentile scale values of 162 female students who were planning to be guidance counselors, and the horizontal line covers the scale values of the middle 50% of these students.

Instructions for the practical use of the profiles are included in the Career Data Book. Also included are lists of commonly available tests which produce scores that can be made equivalent to the scores in the profiles.

THE STUDENT'S BOOKLET provides instructions and information suitable for students to use with the Career Data Book. A sample copy of the Student's Booklet has been enclosed.

Comments on the CAREER DATA BOOK by leaders in the field of career guidance:

"I am impressed with the wealth of data that is presented in the Career Data Book, and feel that it will be a valuable tool for counselors as well as students."

--Norman C. Gysbers
Professor of Education, University of Missouri-Columbia
(President, National Vocational Guidance Association, 1972-73)

"This book can be a giant step in the direction of providing better career counseling for high school youth....The wide range of interests, abilities and information scores within any one occupation are also highlighted for student and counselor....In my opinion, the Career Data Book is an outstanding contribution to the practitioner and theorist alike in the area of career choice and determinants."

--S. Norman Feingold
National Director, B'nai B'rith Career and Counseling Service
(President, National Vocational Guidance Association, 1968-69;
president-elect, American Personnel and Guidance Association, 1973-74)

"I feel it would be particularly valuable to the high school counselor who oftentimes has a difficult problem of getting students to understand their interests and abilities, particularly as these pertinently relate to present and future educational preparation and vocational activities whereby they may be able to earn a livelihood."

--C. C. Dunsmoor
(President, American Personnel and Guidance Association, 1962-63)

"You have collected a body of data worthy of very careful study on the part of all professional counselors concerned with problems of career guidance and counseling....In my opinion, this document should be required reading for all secondary school counselors."

--Kenneth B. Hoyt
Professor of Education, University of Maryland
(President, American Personnel and Guidance Association, 1966-67)

(1/2 actual size)

Importance: Much time lost through wrong choice of occupation or curriculum. Proper guidance can prevent wrong choice in many cases, thus contributing to happiness of individual and prosperity of community.

Training: For employment counselor trainee in state employment office, minimum is bachelor's degree, preferably with major in a social science, plus 15 semester hours in counseling and related courses. For employment counselor, master's degree or 30 hours in counseling related courses. For master counselor, master's degree and three years of experience, including one in employment counseling. Among other agencies requirements vary; most prefer master's degree in counseling or related field. In-service training often available.

For rehabilitation counselor, basic requirement is bachelor's degree with credits in counseling and related fields. Many employers require master's. Some stress work experience. For some state services, civil service exam required.

For college placement officer, minimum requirement is bachelor's degree; should be in one of the behavioral sciences. Business or other outside experience helpful. For school counselor, see p. 116.

Work Activities: Employment counselor interviews clients, takes educational and work histories, gives tests, checks references, discusses client's abilities, preferences, and job prospects with him. Locates possible job sources; should be familiar with local services and opportunities. Advises on further training if needed. Sometimes does group counseling. Most work in state employment offices; others for private or community agencies, prisons, training schools, mental hospitals.

Rehabilitation counselor works with handicapped individuals. Interviews clients, gathers available information on them. Works out rehabilitation plan in consultation with other experts such as doctors, physiotherapists. After rehabilitation helps client find job. May specialize in some particular type of handicapped person. Most rehabilitation counselors paid from state and federal funds; some hired by hospitals, insurance companies, etc.

School counselors talk with students on choice of classes and careers, study academic records and test results, maintain file of literature on various careers, give talks on career choice, lead field trips to job sites. Counselor's first task is to help student choose curriculum that will prepare him for suitable career.

College placement officer does similar work at college level, but also contacts possible employers and their representatives and helps student get part-time jobs.

Outcomes: Individuals who have chosen suitable curriculum and career.

Supervision; Social Relations: Supervised by superior in organization. May supervise paraprofessional aides. Good relations with client, other experts, and community representatives, and ability to work on a team important.

Salary; Other Benefits: In 1970, minimum salaries for state employment counselors were $6,100 to $11,600, and averaged $7,700. Maximum salaries $7,700 to nearly $14,000; mean about $9,900. May be less for voluntary agencies. Most counselors have good employee benefits.

Rehabilitation counselors in state agencies earned about $7,800-$10,000 a year. Those hired by Veterans Administration paid $13,493 or $14,665, with doctorate $13,493-$16,790. Average salary for rehabilitation workers with doctorate, $18,900.

College placement officer directors, in 1970, earned from less than $5,000 to over $27,500, with median at about $12,250. Deans of testing and counseling had median salary of $13,800.

For school counselor, see p. 116.

Role of Sexes: About half of employment counselors, 30% of rehabilitation counselors, 25% of college planning and placement counselors, are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (70th percentile) in natural sciences, public service, and literary/linguistic; extremely low (25th percentile) in office work.

Similar to: Guidance/Counseling and Social Worker.

Information

General: Average around 80th percentile on information scores; high (86th percentile) in mathematics; low (76th percentile) in biological science.

Specific: 66th percentile in aerospace, farming, health, and engineering; 70th percentile in law; 74th percentile in military, accounting, business and sales, and outdoor activities.

Similar to: Guidance/Counseling and Social Worker.

Abilities

General: Around the 76th percentile in ability scores; highest (83rd percentile) in introductory math; low (66th percentile) in three-dimensional visualization.

Similar to: Guidance/Counseling.

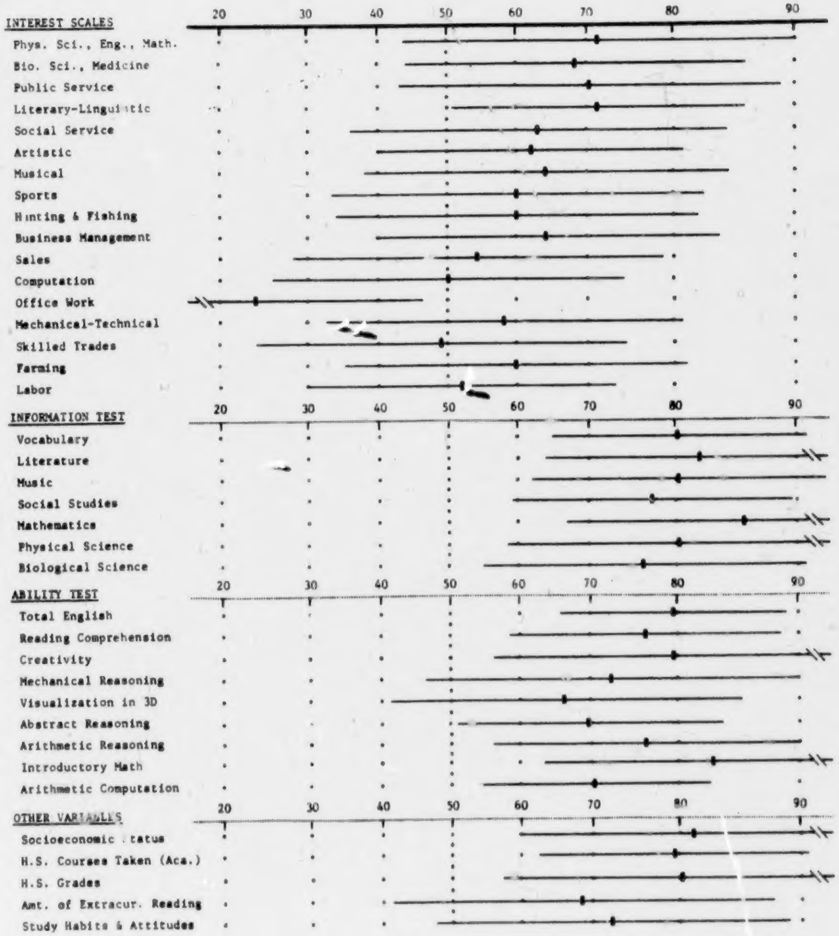
Others

General: High (81st percentile) in socioeconomic status; low (68th percentile) in extracurricular [illegible]ing.

Specific: 62nd percentile in social sensitivity and self-perception of reading skills.

Similar to: Guidance/Counseling and Social Worker (Females).

(Female - n = 162)



"In general, it looks to me as though [the authors] have done a most useful job in organizing Project TALENT data in such a way as to make them useful for counselors. I think you do a balanced job of pointing out both the strengths and weaknesses of the data, of pointing out the possibilities of use and precautions which counselor, student and parent must keep in mind."

--Donald E. Super
Professor of Psychology and Education, Teachers College, Columbia University
(President, National Vocational Guidance Association, 1969-70;
president, American Personnel and Guidance Association, 1953-54)

"In general it should prove to be a very useful sourcebook and help to counselors and young people in relating themselves to the world of work. The bulk of the book, which includes Career Group and individual occupation descriptions and profiles, is full of useful information and presented in a useful way."

--Albert S. Thompson
Professor of Psychology
Program in Counseling and Personnel Psychology
Teacher's College, Columbia University

"On the whole I can see that the Career Data Book will be a useful and handy guide for the counselor... It is a valuable and unique tool that will add significantly to their resources for helping students explore alternatives."

--Anita M. Mitchell
Director of Research and Pupil Services
Culver City Unified School District, California
(President, California Personnel and Guidance Association, 1970-71)

"I am very impressed with all the valuable data that is included in your follow-up. It should give career counseling a big shot in the arm to have such a valuable resource upon which to build a program."

--Clarence A. Mahler
Professor of Psychology, California State University, Chico, California

"The publication presents much information that should be of tremendous value to counselors and students and the general organization and presentation are carefully done....All in all, the authors of the manual and all of those involved in the collection of the data are to be commended on making what can be a most significant step ahead in guidance."

--Ralph F. Berdie
Professor of Psychology, University of Minnesota
(President, American Personnel and Guidance Association, 1970-71)

Ordering Information

CAREER DATA BOOK: 1 copy $5.50; 10-49 copies $4.50 each; 50-99 copies $4.25 each; 100 or more copies $4.00 each.

STUDENT'S BOOKLET: 25 copies for $3.00; 100 copies for $10.00.

AMERICAN INSTITUTES FOR RESEARCH, P.O. BOX 1113, PALO ALTO, CALIF. 94302

Please send me _____ copies of the Career Data Book at _______ a copy. Also please include _____ copies of the Student's Booklet. I have enclosed a check or money order* for _______.

Mail to: ______________________ Bill to*: ______________________
______________________ ______________________
______________________ ______________________
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*Postage and handling fee will not be charged when check accompanies order.

THE CAREER DATA BOOK:
RESULTS FROM
PROJECT TALENT'S
FIVE-YEAR FOLLOW-UP STUDY

John C. Flanagan
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FOREWORD

Project TALENT is a twenty-year longitudinal study of American youth, relating their aptitudes, interests, and education to their occupational choices. It is being conducted by the American Institutes for Research and supported by the National Institute of Education. The **Career Data Book** summarizes interim results of the project, providing the high school student and guidance counselor with a large amount of objective data on just what types of students actually go into different occupations. In this book, Project TALENT reports these interim results — the relations between test scores in high school and occupations five years after high school — and offers a tool for practical guidance counseling. By using the profiles in this book, in conjunction with the counselor's profile of the individual student, the guidance counselor will be able to tell the student the extent to which he matches the typical members of an occupation, or group of occupations. Students can use this information to develop their career plans. There are other types of analyses based on the same raw data available from Project TALENT (Flanagan et al., 1971). However, these are more difficult to interpret for practical guidance counseling.

In Chapter 1 we describe Project TALENT and summarize the tests given to approximately 400,000 high school students in 1960 and the follow-up questionnaires through which we have monitored their progress in education and work. We explain the classification of selected occupations into career groups on the basis of the nature of the occupations and the type of training and abilities they require.

In Chapter 2, we explain the use of the **Career Data Book** profiles and the **Student's Booklet.** We discuss the need to determine the student's percentile rank on various interests, types of knowledge, abilities, and other characteristics and explain the way to enter them in the **Student's Booklet.** We then explain the procedure for exploring suitable careers for a given student by comparing his percentile ranks with the tables in Chapters 3 through 14.

Each of the last twelve chapters of the book focuses on a particular group of occupations that the TALENT data indicate are similar to each other. The student can be directed to a particular career group to explore the occupations within that group, by looking at the corresponding chapter. Of course, students should not assume that they match only one career group. On the basis of their qualifications, most will have a wide range of career groups from which to choose.

We wish to acknowledge that the occupational descriptions used in this book are derived from the **Occupational Outlook Handbook,** published annually by the U.S. Department of Labor and the Bureau of Labor Statistics. That volume goes into much more detail about the various occupations and includes many more occupations than it is possible for us to do. The more detailed government publication could well be used in conjunction with the **Career Data Book.** To order the **Occupational Outlook Handbook,** write to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. In 1973, it cost $6.25.

The preparation of this book involved the cooperation of many people. The original outline, the general plan of the book, and the selection of the variables to be included in the profiles for all the occupations was primarily the responsibility of the senior author, John C. Flanagan. Supervision of the initial drafts of the various chapters and appendices and the development of the statistical data and the career group descriptions was the responsibility of David V. Tiedeman. The early drafts of Chapters 1 and 2 and the occupational descriptions in Chapters 3 to 14 were written by Mary B. Willis. The final draft of Chapter 2 was prepared by Donald H. McLaughlin who also supervised completion of the appendices. He was assisted particularly in the revision of Chapter 2 by Laurie Ganschow. The occupational description format was developed by Robert Gagné, and the preparation of the career data profiles was supervised by Nancy Brunstetter. The data entered in the profiles are the results of the work of Melanie Austin, John Bird, Mary Hurst, and Sue Turner. Work on a preliminary version was done by Yungho Kim. Emily Campbell typed drafts and the final version. Finally, we thank Professor Donald Super and five high school counselors, Richard Carey, Dorothy Hanson, Ede Scammon, Arnold Steinbach, and Shirley Bergen, for their valuable criticisms of manuscripts for the book.

Section I
Introduction

CHAPTER 1
PROJECT TALENT AND ITS FINDINGS FOR CAREER GUIDANCE

Using TALENT Data to Help Choose a Career

This book is designed to be a practical resource for counselors who assist students in examining and exploring various career options. The **Career Data Book** provides information on the characteristics of high school students who eventually prepared to enter, or were actively pursuing, careers in various occupations and professions. The data reported in this book are taken from the Project TALENT five-year follow-up of approximately 100,000 individuals. These data are unique in that they focus on the characteristics of students in high school — a time when counselors traditionally have the greatest impact. Yet a recently completed study reveals that counselors are not providing all that is needed in the way of practical career guidance for students, particularly noncollege-bound students (Ganschow, Helliwell, Hamilton, Jones, and Tiedeman, 1973).

The **Career Data Book** is a positive step in the direction of providing better career counseling for high school youth. The TALENT data can tell the counselor and the student what individuals who eventually pursued specific careers were like when they were in high school. While this is in no way an absolute determinant of the career a student should enter, it does suggest possible alternatives for the student in need of suggestions. It also gives an indication of the amount of effort, in terms of developing various interests, information, and abilities, which might be required of a student in order to pursue a given occupation. However, although the data have been demonstrated to predict entry into an occupation, the data for prediction of ultimate success or satisfaction in an occupation are not yet available.

Several efforts have been made in the past to examine the types of individuals who enter various occupations. One longitudinal study (Thorndike and Hagen, 1959) looked at the entry characteristics of individuals who were in known occupations twelve years later, but their efforts were much more limited than the TALENT study in terms of sample size, composition, and the battery of tests administered. Since TALENT has data on the characteristics of high school students who later went into various occupations and professions, the reader can help locate career possibilities for any given student by encouraging him to compare his characteristics with those of TALENT students who followed educational and/or occupational paths that led them into various careers. For example, if a student displays a pattern of percentile rankings with respect to interests, information, abilities, high school record, and other relevant characteristics similar to that of students who later became agricultural specialists, a career as an agricultural specialist will probably be a realizable choice for him. And he should be helped to gain information about that and related occupations. The student should be made aware that these data are **descriptive** and not prescriptive, and in particular, a student with low socioeconomic status should be encouraged to aim for careers suited to his abilities and interests even though these careers are presently held by people with high socioeconomic backgrounds.

The Project and Its Tests

Purpose and Design

Project TALENT is both cross-sectional and longitudinal. Its overall goal is to understand the nature and development of the talents of America's young men and women. Within this broad context, Project TALENT has the following specific goals:

1. To obtain a national inventory of human resources.
2. To develop a set of standards for educational and psychological measurements.
3. To provide a comprehensive counseling guide indicating the patterns of aptitude and ability which are predictive of entry into various careers.
4. To formulate a better understanding of how young people choose their life work.
5. To identify the educational experiences which better prepare students for their life work.

In March 1960, to achieve these goals, Project TALENT gave a large and representative sample of high school students a comprehensive battery of paper-and-pencil tests and inventories. Members of the sample are now being periodically followed up by questionnaire over a 20-year span. This design made Project TALENT the first large-scale, long-range longitudinal study of a representative sample of students assessed in high school with a comprehensive set of psychological, educational, and personal measures.

The overall design of Project TALENT provides for follow-ups approximately one year, five years, eleven years, and twenty years after each of the four classes graduated from high school. The one-year and five-year follow-ups have been completed, and the eleven-year follow-up is in progress.

The present data book focuses on the five-year follow-up in relation to the third of TALENT's five goals. Before entering into a detailed discussion of that phase, however, we provide a thumbnail description of the 1960 initial survey phase.

The Sample

The first step was to draw a stratified random sample of all secondary schools in the United States that contained grade 12. Public, parochial, and private schools and schools with different racial compositions were included. About 93 percent of the selected schools agreed to participate in Project TALENT. All students in grades 9-12 in these schools were in the TALENT probability sample; also included were 9th graders in the associated junior high schools. Altogether between 4 and 5 percent of all secondary schools in the United States were included. There were roughly 400,000 students in grades 9 through 12 attending the participating high schools. The selection of the national sample surveyed in 1960 is described in considerable detail in **Design for a Study of American Youth** (Flanagan, Dailey, Shaycoft, Gorham, Orr, and Goldberg, 1962, Chapter 3).

The Test Battery

The TALENT test battery, which required two days of testing time, consisted of numerous aptitude and achievement tests and three questionnaires or inventories. The Interest Inventory questionnaire was concerned with occupational interests. The Student Information Blank called for background information about the student — his school activities, hobbies, home, family, long-range plans, etc. The Student Activities Inventory was a general personality inventory. Appendix A, Part I, describes the contents of the battery more fully. Should the reader wish further details, he is referred to **Design for a Study of American Youth** (Flanagan et al., 1962) which describes the various tests and inventories in further detail, and to **The American High School Student** (Flanagan et al., 1964) which describes the distributions of scores on the tests. TALENT's analyses and findings involve the use of 109 predictive variables from the battery comprised of 64 cognitive variables (test scores) and 45 noncognitive variables (based primarily on responses to questionnaires).

The personal characteristics noted in Chapters 3-14 for each career group and its associated occupations are based on the 1960 students' scores on these test and inventory scales. Since these tests and inventories are not generally available, the counselor will have to use judgment in selecting equivalent data or estimates that are available to him. We are therefore giving, in Appendix A, fairly detailed descriptions of each test and inventory to help the counselor make such judgments on an informed basis. In Chapter 2 and Appendix A we also report comparisons of available instruments with each of the TALENT test and inventory scales. These comparisons are made in order to suggest available tests which are similar to the TALENT tests. Appendix A also summarizes the available data on the equipercentile equating of these similar tests with their equivalent TALENT tests. Alternatively, the counselor and/or the student can use percentile data from tests judged to be similar or estimate his standing on a percentile scale from grades and his general record on standardized tests.

The Interest Inventory asked students to provide a description of their interests by having them indicate on a five-point scale how much they would like various occupations and activities. The interests considered are physical science, engineering, and math; biological science and medicine; public service; literary-linguistic; social service; artistic; musical; sports; hunting and fishing; business management; sales; computation; office work; mechanical-technical; skilled trades; farming; and labor. Data on these interest variables as well as on the other tests described below are presented in the profiles which report the TALENT data throughout this book.

To simplify the counselor's task, we have included only those TALENT tests and inventories that are most predictive of occupational choice in this book. The Information tests included in our Information test profile are vocabulary, literature, music, social studies, mathematics, physical science, and biological science. These are the measures presented for all occupational groups; measures of special significance for individual occupations among the remaining Project TALENT variables are not listed on the profiles, but are mentioned on narrative Personal Characteristics passages preceding each of the occupational profiles.

The Ability test profiles have a division of variables similar to the division of variables in Information test scores. One set of variables is useful in describing all occupations; the other set is useful in describing the persons entering a few specific occupations. The ability tests included in the profiles of all occupations are composite English, reading comprehension, creativity, mechanical reasoning, visualization in three dimensions, abstract reasoning, arithmetic reasoning, introductory mathematics, and arithmetic computation. These measures are based on the concept of a student's developed ability to perform rather than on any theoretical concept of "aptitude" or "intelligence." "Ability" in this sense is therefore regarded as a measure of present status rather than a necessarily fixed characteristic.

The Student Information Blank scales are divided in the same way as those of the Information and Ability Tests. Some of these scales are used uniformly in all occupational descriptions; others only in certain occupations. The uniform variables are listed on the profiles as the "Other Variables" scores. They refer to socioeconomic status, the extent to which the student's high school courses were academically oriented, high school grades, amount of extracurricular reading, and study habits and attitudes.

The Activities Inventory does not differentiate very well among the occupations, and the separate scales are fairly short and have only moderate reliability. Hence, scales on the Activities Inventory are used only in particular instances to confirm specific occupational personality characteristics.

The Five-Year Follow-Up Questionnaires

The presence of 1960 students in the various occupations and career groups given in Chapters 3-14 was determined by mailed questionnaires. Although somewhat different questionnaires were used for each class, all questionnaires included a common core of items tapping information vital to the study of further education, jobs, and career plans. The questionnaires were designed as simple factual data-collection instruments rather than as clinical tools for psychiatric probing. Therefore they could be set up to be self-administering. The questionnaires sent to each grade are presented in full by Flanagan et al. (1971).

The Follow-Up Procedure

The five-year follow-up for a given grade included four mailings or "waves" of the questionnaire. On the average, about a third of the sample completed and returned the mailed questionnaire, leaving about two-thirds in the nonrespondent category. A representative sample of nonrespondents was chosen and tracked down to determine how nonrespondents were different from respondents in regard to personal characteristics and occupations.

Deriving Career Groups

Project TALENT derived rational and useful clusters of occupations so that the high school student need not choose one specific occupation, but could continue to prepare for a set of occupations from which to make a later, more knowledgeable specific choice. This allows the student to make tentative plans for his education without tying himself to a premature occupational choice. Leaders in vocational guidance have been urging for some years that the student predicate his choice of a specific occupation upon the choice of a broad career area. They counsel that educational planning, particularly at the secondary school level, should leave as many doors open to the student as possible while helping him toward the specification of next steps in his career plan. The many thousands of occupations available make it very difficult for the student to select a single one early in his high school career.

Studies of Project TALENT students have clearly demonstrated that high school choices of occupations are often both transitory and inappropriate. Yet one of a student's most important decisions, the academic course of study he will follow in high school, must be made early in his high school years. The way occupations are grouped together should be based on the type of high school programs they require, and specifically on whether or not the occupations in a group require college training. Occupations contingent on a college education require a higher general academic ability than other occupations. In addition to the level of general academic ability, which is heavily dependent upon ability to read and understand materials, success in many occupations may also depend on special abilities for dealing with mathematical concepts, spatial and mechanical relations, clerical skills, or a number of other special aptitudes such as art, music, or the theater. Finally, interests provide a further basis for classifying occupations, since the interests of the student are an important factor in determining the occupation he will enter.

Based on these considerations, together with substantial experience over many years in determining the interests, information, and abilities related to particular occupational activities, a tentative definition of 12 career groups was made. These 12 groups corresponded quite closely to 12 of the Project TALENT interest scales. The allocation of occupations to these 12 career groups was based on the TALENT five-year follow-up data for grade 12 (14,125 males and 14,703 females), and was checked using the results from the grade 11 classes.

Students responding to the questionnaire sent them five years after completing high school were grouped according to the occupation which they said they planned to make their career. Occupational group membership was then purified to include only those respondents reporting specific career plans and making reasonable progress toward attaining their goals. Only those respondents who were actually in a job or who were in a position or type of training program which could lead to this job were included (Flanagan et al., 1971, Chapter 6). It should be pointed out that the actual job five years after high school is often transitional and that the data in this book refer, therefore, to career **plans.**

Since it was felt that a minimum of about 40 or 50 cases from all grade levels combined would be necessary to make valid generalizations, occupations chosen by less than ten people of one sex in any one grade level were eliminated from the data. The means and standard deviations were then calculated on each of 64 cognitive and 45 noncognitive TALENT variables for the males and for the females in both the 11th and 12th grades. These data were inspected to determine whether the people in each of the tentative job clusters were in fact homogeneous with respect to their TALENT scores, and if found otherwise, adjustments were made. There was some initial indecision as to whether architects should be classified with physical scientists and engineers or with the fine arts group. A study of the test means indicated that architects were much more similar to scientists and engineers than to the other group, and they were classified accordingly. Similarly, it had initially been thought that computer programmers should be classified with mathematicians and engineers, but it was found that the persons who five years out of high school were either computer programmers or planning to be computer programmers had scores more like those in the technician group. Other interesting departures from our initial stereotypes are that pilots are really more like business administrators than like engineers and scientists, and photographers are more like technicians than artists. At least that is to be inferred from their high school test scores. See Appendix B for other statistical checks on the occupational groupings.

Although it is possible that data from the eleven-year TALENT follow-up study may modify some of these groupings, the general agreement between the results for 11th- and 12th-grade students indicates that the present groupings should be very useful for general guidance purposes. It should be kept in mind, however, that the five-year data indicate only career preparation and entry, not ultimate success.

As noted above, the profiles for career groups and for occupations within each such group reported in Chapters 3-14 of this book are for occupations which 40 or more students entered or prepared for. In order to make results comparable, raw scores were first converted to percentile ranks within a particular grade and sex. It was then found that percentile ranks for the various occupations did not vary markedly with grade. Results for all grades were therefore combined, but for each sex separately. When an occupation had both a male and a female profile, only the profile for the larger of the two groups is reported in Chapters 3-14, and it is this profile which determines the occupational data reported for the career group to which the occupation is assigned. However, this should not inhibit students from exploring all occupational alternatives, because men and women should enter occupations without regard for sex stereotyping. The reason it is useful for the counselor to acquaint his students with the majority profile for an occupation is that the student needs to recognize that competition for entry into an occupation is defined chiefly by the majority. Furthermore, women should be informed that although in the past only exceptionally able women have entered training for professional work, women with more moderate abilities can now expect to be accepted into a wider range of professions.

The occupations included in each of the twelve career groups are given in Table 1. The occupations for which women are in the majority are indicated by "(Females)." More information can be found on each of these career groups, and the profiles that characterize them, at the beginning of Chapters 3 through 14, each of which deals with a separate career group and the occupations included in it. In these chapters a career group description and distinctive personal characteristics are noted for each career group.

Table 1

LIST OF THE OCCUPATIONS INCLUDED IN EACH OF THE 12 CAREER GROUPS IN THE CAREER DATA BOOK

1. Engineering, Physical Science, Mathematics, and Architecture

- Architect (A)
- Chemist (B)
- Engineer (n.e.c.)* (C)
  - Aerospace (D)
  - Chemical (E)
  - Civil, Hydraulic (F)
  - Electrical, Electronic (G)
  - Mechanical, Automotive (H)
- Geologist (I)
- Mathematician, Statistician (J)
  - College Mathematics Teacher (K)
  - High School Mathematics Teacher (Females) (m)
- Physical Scientist (n.e.c.) (N)
- Physicist (O)
- Science Teachers
  - College Science Teacher (P)
  - High School Science Teacher (R)

2. Medical and Biological Sciences

- Agricultural Specialist (A)
- Biologist, Zoologist (B)
- Dentist (C)
- Nurse (Females) (d)
- Pharmacist (E)
- Physician (F)
- Veterinarian (G)
- Wildlife/Conservation Specialist (H)

3. Business Administration

- Accountant, Auditor, Comptroller (A)
- Advertising Worker (B)
- Business Administration and Management (n.e.c.) (C)
- Certified Public Accountant (D)
- Efficiency Expert, Industrial Engineer, Production Manager (n.e.c.) (E)
- Finance Worker (F)
- Industry, Business, Commerce (n.e.c.) (G)
- Investment Consultant (H)
- Manufacturing Management (I)
- Marketing and Wholesale/Retail Trade Manager (J)
- Military Officer (K)
- Personnel Administrator (L)
- Pilot (M)
- Purchasing Agent (N)
- Retail Buyer (Females) (r)
- Stockbroker (S)
- Teacher - Commercial Education (Females) (t)

4. General Teaching and Social Service

- Clergyman (A)
- Guidance
  - Counseling (Females) (b)
  - Vocational/Educational (Females) (d)
- Social Worker (Females) (e)
- Teacher (n.e.c.) (Females) (f)
  - Elementary (Females) (g)
  - High School (Females) (h)
  - Preschool (Females) (i)
  - Specialists
    - Handicapped (Females) (j)
    - Home Economics (Females) (k)
    - Physical Education (Females) (l)

5. Humanities, Law, Social and Behavioral Sciences

- Diplomat (A)
- Economist (B)
- Journalist, Reporter (C)
- Lawyer (D)
- Librarian (Females) (e)
- Psychologist (F)
- Social Scientist (G)
- Teacher
  - College (n.e.c.) (H)
  - English
    - College (Females) (i)
    - High School (Females) (j)
  - Foreign Language
    - College (Females) (k)
    - High School (Females) (l)
  - Social Sciences and Studies
    - College (M)
    - High School (N)
- Writer (Females) (r)

6. Fine Arts, Performing Arts

- Artist/Painter, Sculptor, etc. (Females) (a)
- Commercial Artist/Advertising, Fashion, Illustrator, etc. (B)
- Musician/Instrumentalist (C)
- Teacher
  - Art (Females) (d)
  - Music (Females) (e)
- Theater Worker (F)

7. Technical Jobs

- Computer
  - EAM Operator, Supervisor (A)
  - Programmer (B)
  - Repair Serviceman (C)
- Dental Hygienist (Females) (d)
- Draftsman (E)
- Electronics
  - Technician (F)
  - Worker (n.e.c.) (G)
- Laboratory Technician
  - Biological Science, Dental, Medical (Females) (h)
  - Physical Science, Engineering, etc. (I)
- Photographer (J)
- Physical Therapist (Physiotherapist) (Females) (k)
- Specialized Therapist (Miscellaneous) (Females) (m)
- Surveyor (N)
- Technologist/Medical, Dental (Females) (r)

8. Proprietors, Sales

- Clerk/Sales (Females) (a)
- Farming/Ranching - Owner (B)
- Manager/Sales (C)
- Proprietor, Contractor (in business for self) (D)
- Salesman
  - Auto (E)
  - Insurance (F)
  - Other (n.e.c.) (G)
  - Real Estate (H)
- Supervisor/Business (I)

9. Mechanics, Industrial Trades

- Clothing, Fashion Trades (Females) (a)
- Electrician (n.e.c.) (B)
- Machinist (C)
- Mechanic
  - Airplane (D)
  - Auto (E)
  - Other (n.e.c.) (F)
- Metal Worker (G)
- Printing Tradesman (H)
- Repairman
  - Appliance (I)
  - Industrial Machine (J)
  - Office Machine (K)
  - Telephone (including installers) (L)

10. Construction Trades

- Bricklayer, Mason, Painter, Roofer, Plasterer, etc. (A)
- Building Construction/Miscellaneous (B)
- Carpenter (C)
- Foreman (n.e.c.) (D)
- Heavy Equipment Operator (E)
- Mining, Quarrying, etc. (F)
- Plumber, Pipefitter (G)

11. Secretarial-Clerical, Office Workers

- Account Recording Worker/Miscellaneous (Females) (a)
- Bookkeeper (Females) (b)
- Clerical Worker/Miscellaneous (C)
- Clerk
  - Bank (D)
  - Miscellaneous (Females) (e)
- Operator
  - Keypunch (Females) (f)
  - Radio, Telegraph, and Teletype (G)
  - Telephone (PBX) (Females) (h)
- Receptionist, Hotel Clerk, etc. (Females) (i)
- Secretary (n.e.c.) (Females) (j)
  - Legal (Females) (k)
  - Medical (Females) (l)
- Stenographer, etc. (Females) (m)
- Typist (Females) (n)

12. General Labor, Community and Public Service

- Butcher, Meat Cutter (A)
- Driver - Auto, Bus, Truck (B)
- Farming/Ranching - Other (n.e.c.) (C)
- Fireman (D)
- Hairdresser (Females) (e)
- Laborer/General (F)
- Military/Enlisted (G)
- Nurse/Practical (Females) (h)
- Policeman (I)

*n.e.c. means "not elsewhere classified"

CHAPTER 2
USING THE CAREER DATA PROFILES

The Data Format

The objective data that constitute the bulk of this book are presented in the form of profiles of student interests, knowledge, abilities, and other variables. The profiles are presented separately for students who had entered or were preparing for each of 138 occupations five years after high school. The 138 occupations are organized into twelve career groups, which are described in Chapters 3-14. In each of these chapters you will find (1) a general description of the characteristics of the career group; (2) a profile combining and comparing the data on all occupations within the career group (also reproduced in the **Student's Booklet**); and (3) an alphabetically arranged set of profiles and descriptions for each of the specific occupations in the career group.

Examples of the general description and combined profile for Career Group 1 (Engineering, Physical Science, Mathematics, and Architecture) are shown in Figure 1 and Figure 2. There are sixteen different specific occupations within the career group, shown in Figure 1, and each is assigned a letter, from "A" to "R." For example, chemical engineers are assigned the letter "E." These letters are used to indicate occupations on the profile in Figure 2. Capital letters are used for occupations in which men predominate and lower case letters indicate occupations in which women predominate. The importance of this distinction will be explained in the section on obtaining the student's profile, below.

For each profile in the **Career Data Book** there are 38 rows corresponding to the scales used in career description. On the career group profiles, such as in Figure 2, the letters are entered to indicate the mean percentile rank, relative to all high school students, of people who enter the particular occupation indicated by the letter. For example, on a scale of "interest in physical science, engineering, and mathematics," students who entered Career Group 1 (Engineering, Physical Science, Mathematics, and Architecture) were in general higher than the total population of students. But there was a great deal of difference between, say, chemical engineers (letter "E") and architects (letter "A") in the extent of this interest. The average chemical engineer scored higher than 89 percent of the student population in terms of this interest while the average architect scored higher than 71% of the population.

Each profile for a specific occupation also contains 38 rows corresponding to the scales used in occupational prediction. An example of such a profile is given in Figure 3.

For each scale, or row, the profile gives information about both the mean and the variability of scores of high school students who were in or preparing for the given career five years later. The profile in Figure 3, for example, reports the data for individuals who five years after high school reported they planned a career as a housewife. The number of individuals whose data were used in developing these profiles is reported directly below the occupational heading. In Figure 3, the data from 20,747 females were used. Again, whether the scores of males or females were used was determined by which sex had the most individuals entering the particular occupation.

For each scale on the profile, there are both (1) a boldface vertical mark (▌) indicating the mean percentile scale value for the students who entered the occupation and (2) a horizontal line indicating the spread of the scale values for people in the occupation. The horizontal line is drawn to indicate the range of the scale values for the middle 50% of the students who entered the occupation. Therefore, 25% scored a higher percentile than that at the right end of the horizontal line and 25% scored lower than the left end of the line. Parallel diagonal lines (\\ ) on the profiles indicate that the middle 50% of the scores ranged beyond the end of the scale shown. Consider the first scale in Figure 3, for example. The mean "interest in physical sciences, engineering, and mathematics" among housewives who responded was at about the 53rd percentile, or a bit higher than the median (50th percentile) for all female high school students. Twenty-five percent scored higher than about the 76th student population percentile; and the lowest 25% scored below the 27th student population percentile on that interest. In general, the housewives who responded to our surveys had means slightly above the total female student population and rather large ranges of scores. Indeed, there is no evidence that housewives differ from a random sample of women who responded to the follow-up questionnaire.

In order to compare the characteristics of the different career groups, the reader should examine the profile in Figure 4, which is also reproduced in the **Student's Booklet.** On each scale of this profile, numbers corresponding to the twelve career groups indicate where that career group stands in relation to the total high school population. For example, the first row of Figure 4 indicates that a typical member of Career Group 1 has a greater interest in physical science, engineering, and mathematics than about 83% of the total student population.

The scales on information and abilities in Figure 4 show that the scale values for people in the lower numbered career groups (1 through 6) are generally higher than the values of other groups. On the interest scales, of course, the results are much more differentiated across occupations, with each career group among the highest on some scale of interest.

Limitations of the Data

Although the sample of students tested in Project TALENT was unprecedented in its size and representativeness, there are four limitations inherent in the data, of which the potential user should be aware. We believe these limitations are not so important that the data are greatly distorted, and in later versions of the **Career Data Book** it will be possible to remove the first three. Two of the limitations are due merely to the fact that only five years intervened between high school graduation and the follow-up data collection.

First, there was not enough time to assess who was "happy" or "successful" in an occupation, only to record who entered it. (In the eleven-year follow-up, this question is being intensively investigated.)

Figure 1

CAREER GROUP 1

Engineering, Physical Science, Mathematics, and Architecture

Occupations in Career Group 1 involve both mathematical and scientific abilities. Persons working in these occupations apply the principles of physical science and mathematics to many different fields. They may work in research areas or in areas of practical application. Physical scientists, for example, do research with non-living or inorganic materials. Engineers apply their knowledge and experience to developing economical ways of using the raw materials and the forces of nature for the benefit of mankind.

The occupations included in Career Group 1 with their respective codes on the Career Group profile are:

Architect (A)
Chemist (B)
  (also see Science Teachers)
Engineers (not elsewhere classified) (C)
  Aerospace (D)
  Chemical (E)
  Civil, Hydraulic (F)
  Electrical, Electronic (G)
  Mechanical, Automotive (H)
Geologist (I)
Mathematician, Statistician (J)
  College Mathematics Teacher (K)
  High School Mathematics Teacher (Females) (m)
Physical Scientist (not elsewhere classified) (N)
Physicist (O)
  (also see Science Teachers)
Science Teachers
  College Science Teacher (P)
  High School Science Teacher (R)

These occupations all require at least four years of college or university with many courses in science and mathematics.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (80th percentile) in physical science, engineering and math; high (65th percentile) in biological science; lowest (34th percentile) in hunting and fishing, skilled trades, and labor.

Information

General: Average around 80th percentile on information scores; highest (85th percentile) in mathematics; lowest (75th percentile) in music and biological science. Career Group 1 also showed a secondary high in physical science.

Specific: High (76th percentile) in aerospace, and electricity and electronics; 65th percentile in engineering; 62nd percentile in mechanics; 70th percentile in scientific attitude.

Abilities

General: Around the 80th percentile on ability scores; highest (85th percentile) in introductory math; lowest (70th percentile) in arithmetic computation.

Specific: High (85th percentile) in advanced math; 72nd percentile in memory for words; 65th percentile in table reading.

Others

General: High (75th percentile) in academic orientation of high school courses, high school grades, and study habits and attitudes; low (62nd percentile) in extracurricular reading.

Specific: 42nd percentile in sociability; 55th percentile in social sensitivity; 60th percentile in self-perception of reading skills.

Figure 2

CAREER GROUP 1

Engineering, Physical Science, Mathematics, and Architecture

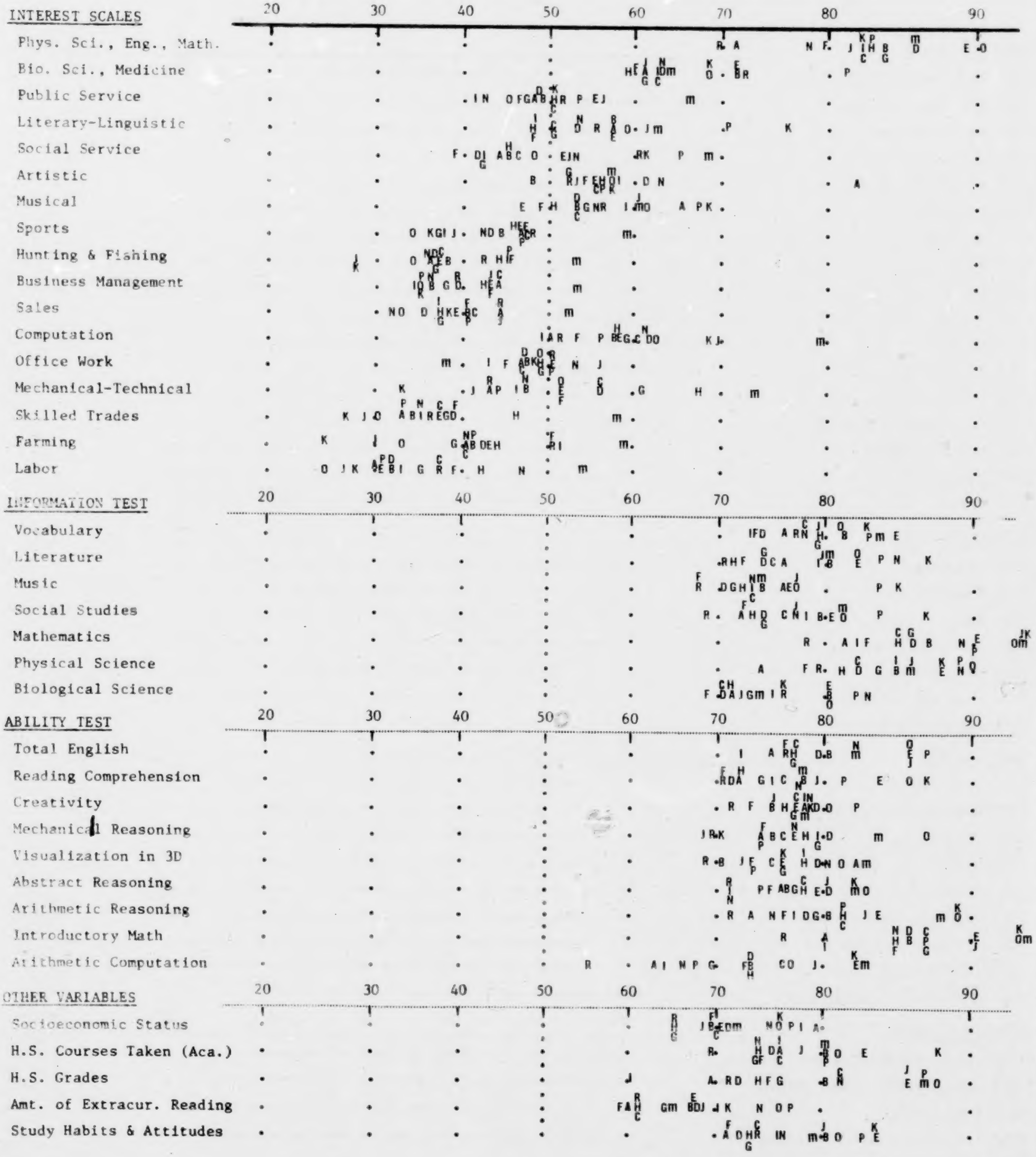


FIGURE 3

HOUSEWIFE

(Female - n = 20,747)

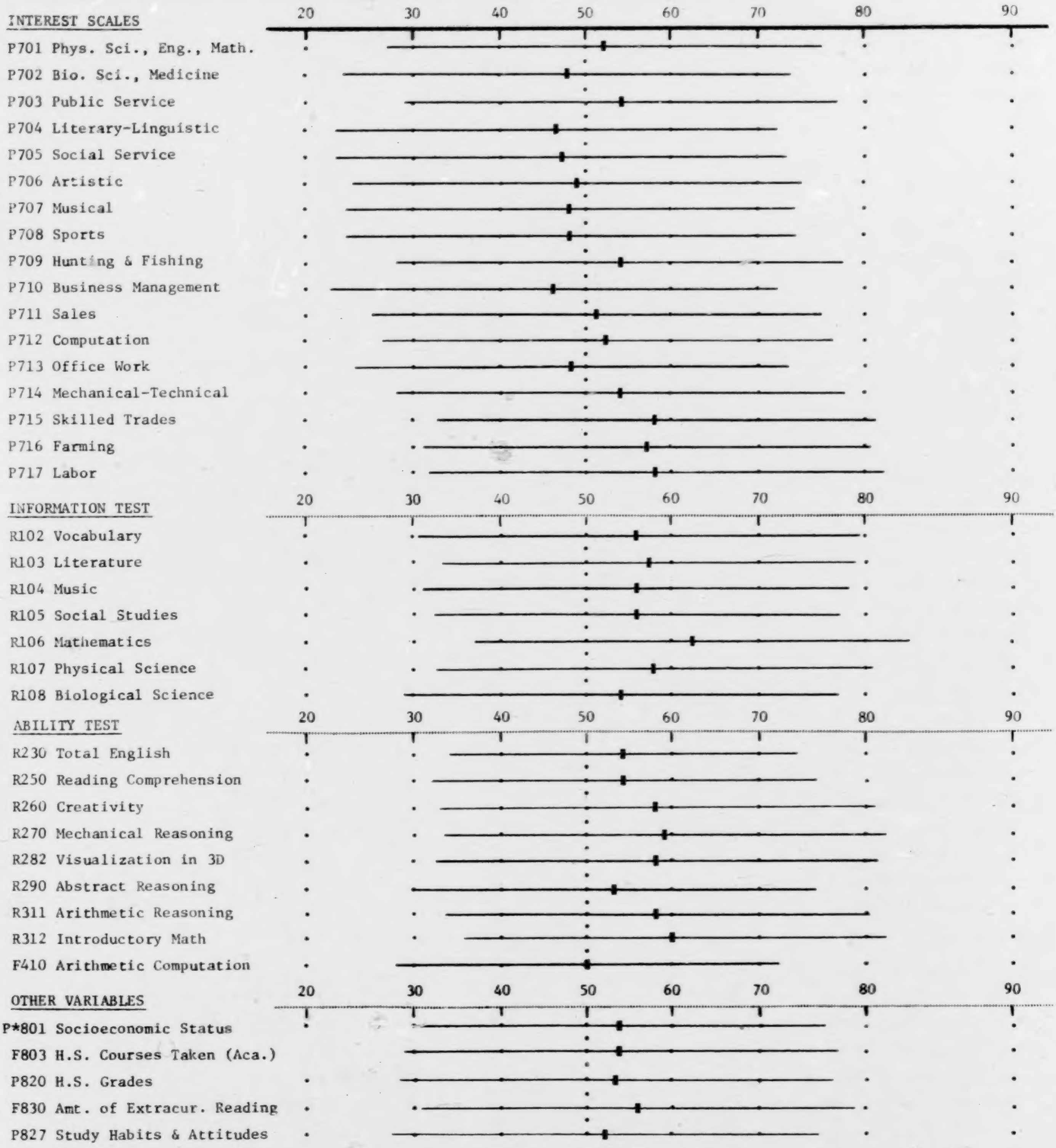
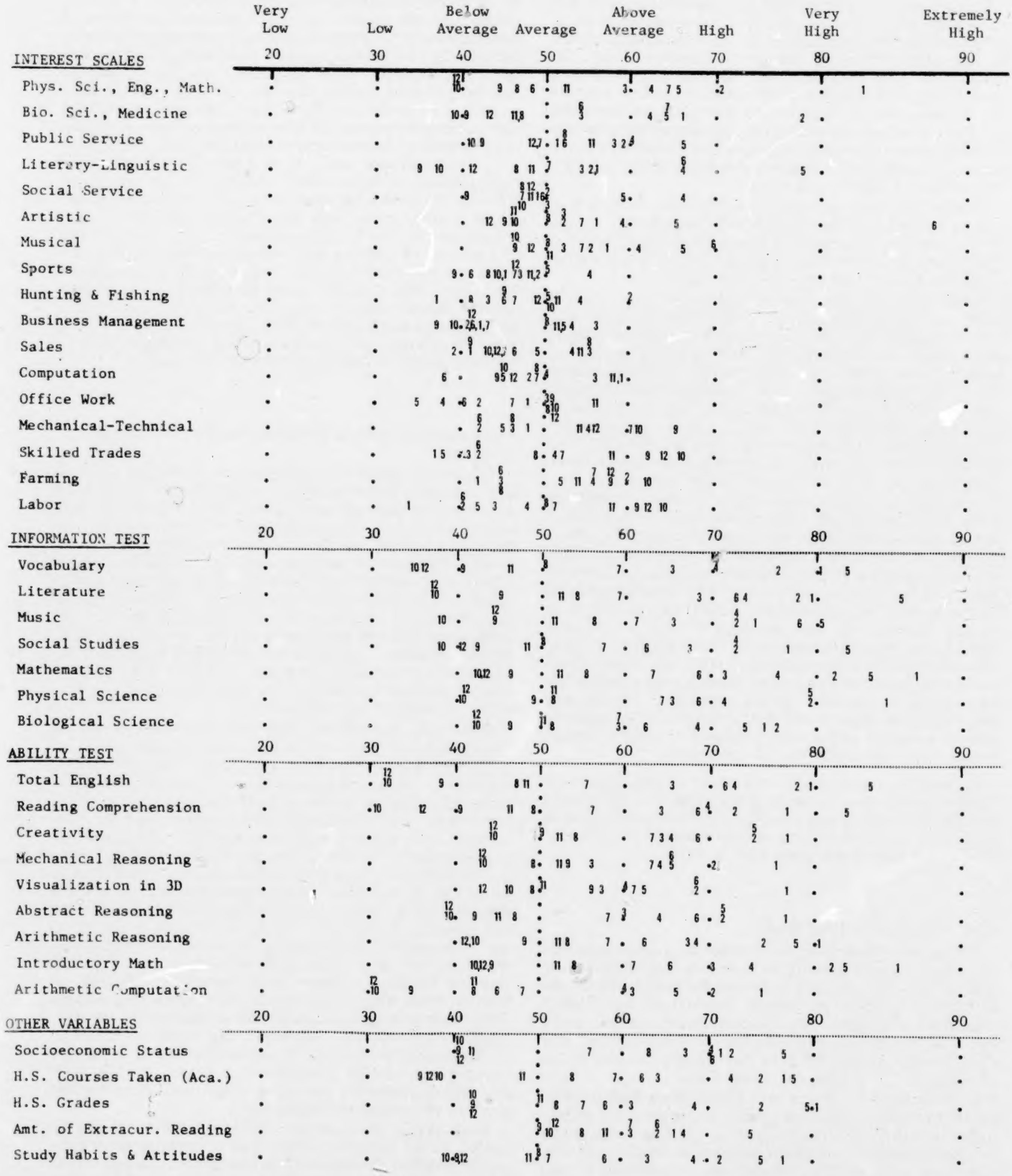


Figure 4

MEAN PERCENTILE RANKINGS FOR STUDENTS IN TWELVE CAREER GROUPS*



*The twelve Career Groups are represented on this chart by their numbers as given in Table 1 on page 3 of the Student's Booklet. For example, five years after their graduation from high school, students who were planning a career in Business Administration (Career Group 3) had a mean vocabulary score (on Information Test) close to a percentile ranking of 65 among students who were in grades 10, 11, and 12 in 1960. These results are based on replies from more than 108,000 students.

Second, one can expect that occupational choices five years after high school are not final; in particular, in occupations requiring a high ability, many of those who are low on that ability will later change occupations. Third, the individuals who responded to the five-year follow-up tended to have higher percentile ranks than those who did not respond. These second and third factors introduce unknown biases in the profiles in opposite directions (one tending to increase scores slightly and the other tending to decrease scores), and we have chosen to assume that they approximately offset each other.

Finally, the data pertain to people who were in high school in 1960, and the profiles will be valid only to the extent that the occupational opportunities and requirements for people who are now being counseled are similar to what they were for the 1960 sample.

Preliminary results are available for the 11-year follow-up on a quarter of the TALENT sample: those who were in grade 12 in 1960. The results are similar enough to the data on which the present book is based so that we believe that delaying the publication of this book until all the 11-year follow-up data are available is unwarranted. The profiles for specific occupations did not change by more than a few percentile points; the most noticeable trend was that for occupations in which competition for selection occurred, in the intervening time ability levels increased slightly in the 11-year follow-up sample.

Although the profiles were very similar, the occupations that many people had entered after 11 years were different from their career plans after 5 years. 70% of men were in different occupations and 52% were even in different career groups; 78% of women (excluding housewives) were in different occupations and 64% were in different career groups. In general, there were fewer people in the 11-year sample who were planning for careers requiring high scores on information and ability variables — those who were planning these careers 5 years after high school, but did not have the high scores, generally switched to less demanding occupations. In the types of career changes that occurred, there were clear differences between the sexes; women, unlike men, tended to move toward careers with less rigid time commitments.

It must be emphasized that these 11-year follow-up results are based on a single grade, and in some careers this means a very small sample size. Only when all four grades are sampled will the results warrant a revision of the **Career Data Book** (sometime in 1976).

Uses of the Career Data Book

The **Career Data Book** is intended as a prototype of a potentially very useful tool for high school guidance counselors evaluating alternative careers for their students. As such, it represents an interim product of the Project TALENT effort, based on five-year follow-up data, and it is hoped that experience with the book will provide guidance to the project on how best to present the future analyses of the 11-year follow-up data.

In addition to the direct use of the **Career Data Book** to facilitate student guidance, there are several secondary uses that the reader might consider. (1) The book can be used as a source of information about occupations in general. For each of 138 occupations, it provides a brief verbal description and a profile of the typical member. Furthermore, since the grouping of occupations into career groups is based on scientific analysis of the similarity of profile patterns among the occupations, it may be useful for theoretical studies and practical problems of occupational change resulting from lay-offs or job dissatisfaction. (2) The book contains a great deal of information on the demography of occupations, providing a rich resource for social studies courses. For example, the data provide a basis for an interesting exploration of current occupational sex roles. (3) The book provides a data base for research on human abilities and interests. For example, if a researcher wants to find people with particular combinations of interests and abilities, he can determine from the book what occupations to investigate. (4) The use of the **Career Data Book** for practical guidance is not necessarily limited to high school students. Although the profiles are of abilities and interests of high school students, an individual's profile relative to others his age will not usually change much in the first few years after high school. Employment counselors in other institutions, such as state employment offices, prisons, or large industries, should be able to make use of the profiles in evaluating individuals for occupations and vice versa.

Using the Career Data Book for Practical Vocational Guidance

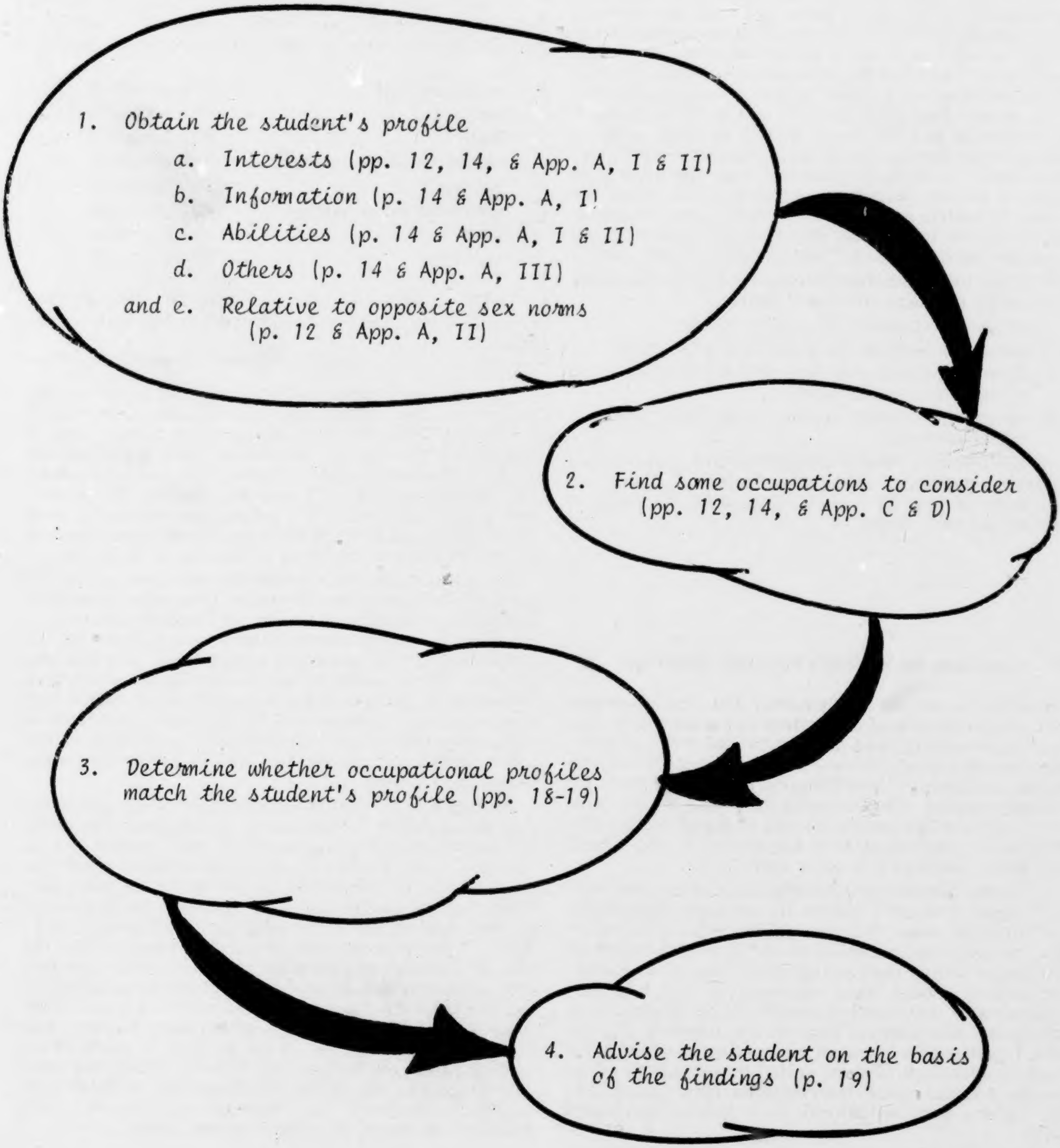
There was a great deal of debate during the preparation of this book whether to include a simple, straightforward cookbook method for proceeding from a student's test scores to a set of occupational recommendations or merely to present the data for the counselor to use as he sees fit. The result is a compromise. On the one hand there is no simple method for correct vocational guidance and to claim to have one is not the intention of the authors, but on the other hand, the procedures for using the profiles are sufficiently difficult that a guide to their use is a necessity. In the "cookbook" methods described below, some of the alternative procedures are easier to follow but less precise; some are more difficult but more precise. An outline of the procedure is given in Figure 5.

It must be remembered that these data only show the student what people in the various career groups were like when they were in high school. If the student's ability and information scores are lower than a large proportion of those planning to make a particular occupation their career five years after finishing high school, this does not mean that the occupation is an impossibility for a student. It does indicate, however, that the student would be competing with peers who have higher abilities, and that if he wishes to be one of the more productive and successful members of his occupation, he should seriously consider occupations in which he "starts out ahead of the average." In considering low scores, it should be remembered that these are tests of developed ability to perform; it is possible for these abilities to be improved, although, of course, some abilities are harder to change than others. Performance scores on Arithmetic Computation are relatively easy to improve, but improving scores on Arithmetic Reasoning is likely to be more difficult and to require much time and effort. Interest in a career, coupled with isolated deficiencies, should provide motivation for the student to remove the deficiencies.

High percentile rankings on information and ability scales, falling beyond the right end of the horizontal lines on the profiles, should never be interpreted to suggest that an occupation is inappropriate for the student, although he should consider whether there are other occupations in which he might make better use of his talents. Also, when

Figure 5

Four Steps for Vocational Guidance


1. Obtain the student's profile
a. Interests (pp. 12, 14, & App. A, I & II)
b. Information (p. 14 & App. A, I)
c. Abilities (p. 14 & App. A, I & II)
d. Others (p. 14 & App. A, III)
and e. Relative to opposite sex norms (p. 12 & App. A, II)
2. Find some occupations to consider (pp. 12, 14, & App. C & D)
3. Determine whether occupational profiles match the student's profile (pp. 18-19)
4. Advise the student on the basis of the findings (p. 19)

some students' scores are compared with the TALENT data it often appears that **many** occupations are possible for them and that no clear-cut direction is indicated. In this case, further exploration and familiarity with activities related to the various occupations and with the prospects for the future availability of jobs in those occupations is needed in order to make a career decision. A student should understand that the occupation he finally chooses will be the result of a whole series of “mini-decisions” over a period of a decade, at least, and that if he explores alternatives at an early stage, he will be more ready to make the right decisions later. As Professor Donald Super has written, “Vocational guidance is not the process of helping a person choose an occupation but rather the process of guiding development so that a series of appropriate, specific, exploratory decisions are made and that an occupational choice . . . will emerge” (Super, 1973).

There are four main steps in using the **Career Data Book** as a tool for practical vocational guidance:

(1) obtain the student's TALENT profile;
(2) determine a set of occupations to investigate;
(3) determine whether the student's profile matches an occupational profile well;
(4) advise the student on next steps in exploring a career in depth.

None of these four steps is straightforward, and they are not always performed in the same fashion, but they are sufficiently distinct from each other to be discussed in separate sections, below.

Obtaining the Student's Percentile Rankings

In order to use the occupational data, the counselor must obtain a profile of the student's characteristics, like the examples in Figures 6 and 7 at the end of this chapter. The counselor should discuss the profile openly with the student and use his help in filling out the profile form in his **Student's Booklet**. The counselor may want to transcribe the student's profile onto an acetate transparency in order to facilitate comparison with the profiles in the **Career Data Book**, although it is not a necessity.

The main difficulty in obtaining the student's profile is that Project TALENT's tests are not now available for use. However, since test results are expressed in percentiles, the counselor can substitute the student's percentile rankings on similar tests and estimates that are available. The school should have measures of the student's achievements and developed abilities in reading comprehension, mechanics of English, mathematics, and science. It is desirable to use all the test data available in the student's records in arriving at these estimates, but if his records are inadequate, the counselor may want to give the student some additional tests before proceeding further.

Tests that yield percentile rankings roughly comparable to those yielded by most of the TALENT tests can be purchased from test publishers, but some of the TALENT tests have no direct equivalent in the commercial market. Therefore, procedures for estimation are described in this section. If you, or the student, feel that the meaning of a certain quality or characteristic is not clear, refer to the test descriptions in Appendix A.

Note: It is more important to obtain an understanding of the student's interests, his strong points, and his weak points than to obtain precise numerical scale values.

If some scores are difficult for you to obtain, but can be informally estimated, use the following table to obtain a (rough) set of numbers to enter into the student's profile:

“extremely high” = **90th percentile**
“very high” = **80th percentile**
“high” = **70th percentile**
“somewhat above average” = **60th percentile**
“average” = **50th percentile**
“somewhat below average” = **40th percentile**
“low” = **30th percentile**
“very low” = **20th percentile**

These are, of course, inferior to hard data obtained from controlled tests, but they are probably better than no data at all.

The percentile rankings that are available are usually those for students of the same grade and sex as the student concerned. However, the percentile rankings used in making the profiles for the **Career Data Book** and the **Student's Booklet** are only those for the sex which made up the majority of TALENT students entering the occupation concerned. Thus, for example, the percentiles used for engineers are those of males in all grades, and those of preschool teachers are those of females in all grades.

The presentation of a profile for only one sex is due primarily to limitations of space. Guidance counselors and students should not hesitate to consider occupations in which the student's sex is in the minority. However, if a girl in high school wishes to compare her interests and abilities with a profile in an occupation in which men predominate, the use of her percentile scale values with respect to other women will be misleading; she will be competing and interacting primarily with men in her career and should measure her abilities and interests relative to their norms.

In Appendix A, Part II are two alternative methods for comparing profiles across sexes. Using these percentile sex correction tables an “opposite sex” profile can be obtained — the student can ascertain what his percentile ranks would be relative to norms of the opposite sex. There are also twelve tables of the means for both sexes for each occupation — one table for each Career Group. Table 2 provides an example. Using these tables, the student's profile can be compared with his or her own sex, with certain qualifications. The tables are not available for many occupations because too few members of one of the sexes were in the occupation to obtain stable profiles. And they do not provide, as do the profiles, a quick visual comparison of the patterns for different occupations and career groups; nor do they indicate the variability of scores. Furthermore, the “opposite sex” scores, when included, are based on smaller sample sizes.

Interest Tests

In order to obtain the student's interest scale values, we suggest the reader use vocational interest tests such as the Strong Vocational Interest Blank (available from Stanford University Press, Stanford, Calif. 94305; price $6 for specimen set, $7.75 for 25 tests and 25 hand scored answer sheets) and the Kuder Preference Record — Vocational

Table 2

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 1

	Occupation																															
	A		B		C		D		E		F		G		H		I		J		K		m		N		O		P		R	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	190	*	269	*	651	*	108	*	157	*	284	*	713	*	418	*	58	*	140	*	81	*	160	164	49	*	169	*	178	73	166	*
INTEREST SCALES																																
P701 Phys. Sci., Eng., Math	71		84		82		86		89		79		84		83		82		81		82		77	86	78		91		83	93	69	
P702 Bio. Sci., Medicine	61		71		62		63		71		60		61		59		62		61		68		63	64	63		68		81	85	72	
P703 Public Service	48		49		50		48		55		46		47		50		41		56		50		55	66	42		45		53	65	51	
P704 Literary-Linguistic	57		57		50		53		57		48		50		48		48		62		76		57	63	53		58		71	75	55	
P705 Social Service	44		45		46		41		52		38		42		45		42		52		61		69	68	53		48		66	52	61	
P706 Artistic	83		48		56		61		56		55		53		57		59		54		58		51	58	63		58		57	67	53	
P707 Musical	66		53		53		53		47		49		54		51		59		61		69		55	61	56		62		68	66	56	
P708 Sports	47		45		48		44		47		48		36		46		37		38		35		55	59	43		34		47	59	49	
P709 Hunting & Fishing	36		38		37		36		37		46		36		44		45		28		28		36	53	35		34		45	66	43	
P710 Business Management	45		36		45		39		44		44		38		43		34		44		35		52	53	36		35		35	50	39	
P711 Sales	45		41		42		35		39		41		37		37		37		45		38		46	52	32		33		41	45	45	
P712 Computation	50		57		61		63		57		53		58		57		49		69		68		71	79	62		63		55	57	51	
P713 Office Work	47		47		47		47		51		45		48		48		43		55		48		59	38	53		48		51	21	51	
P714 Mechanical-Technical	43		47		56		56		51		51		61		67		46		41		33		44	73	47		51		44	76	43	
P715 Skilled Trades	33		34		37		39		37		39		38		46		35		29		27		40	58	35		30		33	51	36	
P716 Farming	40		41		40		42		43		50		39		44		51		30		25		44	59	40		33		41	72	50	
P717 Labor	30		32		37		32		31		39		35		42		33		27		28		42	54	47		25		31	47	37	
INFORMATION TEST																																
R102 Vocabulary	76		81		78		74		85		73		79		79		73		79		83		65	84	78		81		83	92	77	
R103 Literature	76		80		75		74		82		72		74		71		79		79		87		66	80	85		82		84	94	70	
R104 Music	76		74		73		70		76		67		71		72		73		77		85		62	74	73		77		84	85	67	
R105 Social Studies	72		79		76		74		80		72		74		73		78		77		87		68	81	77		81		84	93	68	
R106 Mathematics	81		87		85		86		90		83		86		85		82		92		94		83	92	89		92		90	95	78	
R107 Physical Science	74		85		82		82		88		78		84		81		85		86		88		75	86	89		90		89	96	79	
R108 Biological Science	71		80		70		70		80		68		73		71		75		72		76		59	74	83		80		82	90	76	
ABILITY TEST																																
R230 Total English	75		80		77		79		86		76		77		77		72		86		93		76	82	82		86		87	91	76	
R250 Reading Comprehension	72		78		76		71		84		70		74		72		75		79		87		64	78	78		86		81	92	70	
R260 Creativity	78		75		77		79		77		73		77		76		78		75		78		62	78	78		80		82	90	71	
R270 Mechanical Reasoning	74		75		76		80		77		74		79		78		79		68		70		60	84	77		87		74	89	69	
R282 Visualization in 3D	82		70		75		79		76		73		76		78		78		72		76		61	83	80		81		73	86	68	
R290 Abstract Reasoning	76		76		78		80		79		75		77		78		71		80		82		69	82	71		83		74	85	71	
R311 Arithmetic Reasoning	73		80		81		78		84		76		79		81		77		83		89		77	88	75		89		81	90	71	
R312 Introductory Math	80		86		87		86		90		85		87		85		80		90		95		84	94	85		92		87	95	76	
F410 Arithmetic Computation	63		73		76		73		82		73		69		73		64		79		82		79	83	66		77		67	78	55	
OTHER VARIABLES																																
P*801 Socioeconomic Status	79		69		70		71		70		69		65		65		78		68		76		55	72	75		76		77	83	65	
F803 H.S. Courses Taken (Aca.)	76		80		76		75		83		74		74		74		76		78		88		73	80	74		81		80	87	69	
P820 H.S. Grades	69		80		81		72		86		75		76		74		60		86		93		80	87	81		88		87	92	71	
F830 Amt. of Extracur. Reading	60		67		61		67		67		59		64		61		70		68		71		53	65	74		76		77	81	61	
P827 Study Habits & Attitudes	71		80		74		72		84		71		73		73		76		80		84		75	79	76		81		83	88	74	

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

(available from Science Research Associates, Inc., 259 East Erie Street, Chicago, Ill. 60611; price $8.45 for 25 tests). Table 3 shows which scales on these tests are similar to TALENT interest scales. More information on these and other tests can be obtained from **The Seventh Mental Measurements Yearbook** (edited by O.K. Buros, published by Gryphon Press, Highland Park, N.J., 1972).

For some of the TALENT interest scales the Strong and Kuder do not provide equivalents. In this case the counselor may want to have the student determine his own interest percentile in these areas. Some psychologists believe that students' self-ratings of interest level are as accurate and dependable as the interest rankings yielded by elaborate commercial tests. Others think that self-ratings tend to yield stereotyped answers — that the student says he is interested in what he thinks he should be interested in. In any case, if you decide to have the student rate himself on any of the interest variables, first have him read, or re-read, the discussion of percentiles on page 1 of the **Student's Booklet**, and be sure that he understands what a percentile ranking is. Also stress the fact that he is to compare himself with other Americans of his own age and sex.

Information Tests

For the Information scores you can use school records, the results of standardized tests, or, as a last resort, students' self-ratings. If self-ratings must be used, follow the same procedure suggested for Interest variables.

Ability Tests

Roughly equivalent tests are available for all of the nine ability scales except one, Introductory Mathematics. A percentile ranking for Introductory Mathematics can be estimated from the student's mathematics grades, or may already be provided in percentile form by a commercially published test that he has been given as part of a survey of all students.

Table 4 shows the names of tests roughly equivalent to the TALENT Ability Tests. For the most part, a student's percentile rank on a comparable test can be assumed to be very close to his percentile rank on a roughly equivalent TALENT test. Exceptions occur when the test gives percentile rank norms for only one sex. In those cases be sure to correct the percentile rank to correspond to the sex of the student. For example, if a girl takes a test for which only male norms are available, so that her percentile rank is only available relative to the male population, her percentile rank relative to other girls can be estimated by applying the **reverse** of the percentile sex corrections in Appendix A, Part II (discussed above); that is, by finding the female percentile corresponding to her "male" percentile. Tables for determining TALENT percentile ranks equivalent to certain tests in the Differential Aptitude Test Battery (available from the Psychological Corporation, 304 East 45th Street, New York, N.Y. 10017, price $17.60 for 25 tests and $47.50 for 200 answer sheets), the Flanagan Aptitude Classification Tests (available from Science Research Associates, Inc., 259 East Erie Street, Chicago, Ill. 60611; price: $5.10 for 25 self-marking tests, $6.10 for a specimen set), and the General Aptitude Test Battery (available from the U.S. Government Printing Office, Washington, D.C. 20402; price: $7.50 for 25 tests, $10 for 250 answer sheets) are given in Part II of Appendix A.

Other Variables

There are five "other" scales that should be estimated also. You can estimate the student's percentile ranks, either informally with his help or by using the objective methods outlined in Part III of Appendix A.

A rough estimate of the student's percentile ranking for academically oriented high school courses can be obtained for 9th, 10th, and 11th graders by using the student's current curriculum. If he is presently enrolled in the college preparatory curriculum he can be given a percentile rank of 80; in the general, commercial, or business curriculum, a percentile rank of 25; in any other curriculum, a percentile rank of 9.

An estimate of the student's percentile ranking in regard to high school grades can be obtained by using Table 5. Consider the student's grades in all the courses he has taken starting with the ninth grade, and find his percentile ranking in one of the charts in the table. (For example, if a girl has gotten mostly, but not all, A's, place her at the 90th percentile.) If two percentiles are given for the same grades, take the one that seems more reasonable — if a boy has gotten mostly B's and C's, but the B's outnumber the C's, place him at the 50th rather than the 25th percentile.

For a percentile rank on amount of extracurricular reading, inquire into the number of books (not magazines or comic books) the student has read in the past year. If none, he would fall in the 1st to 25th percentile, if 1-5 at the 50th, if 6-10 at the 75th, if 11-15 at the 90th, if more than 15 at the 99th.

An estimate as to the student's study habits and attitudes can be made by inquiring into his number of hours of study per week, both in and out of school. If none, rank him at the 1st percentile; if 1 at the 10th; if 2-4 at the 25th, if 5-9 at the 50th, if 10-14 at the 75th, if 15-19 at the 90th, if more than 19 at the 99th.

A final note on obtaining the student's profile: it is a picture of the student and may be useful for guidance in ways other than occupational. Scan the profile for unusual points before using it in conjunction with the **Career Data Book** profiles. If a score is surprising, ask the student if he knows why he obtained that score. If there is a chance that the score is spurious, attempt to verify it, perhaps by retesting. It would be sadly unfortunate for a student to pass up a suitable vocation because of, say, his misunderstanding of the instructions on a test.

Determining a Set of Likely Occupations

Some students will have specific ideas when you ask what kind of work they want to go into, but others will have only a vague idea or no idea at all.

For the student with a particular occupational interest, the **Career Data Book** will be useful to decide whether his interest is realistic or not, in terms of his abilities. For this type of student, after you have computed his ability profile, locate the occupation of his expressed interest in the **Career Data Book**. To do this, use Appendix C to locate the appropriate career group and proceed to that chapter. If the occupation is not listed, try to find a similar occupation, or a different name for the occupation that might have been used.

If the student lacks a tentative idea about careers which interest him or if you consider it advisable to encourage him to consider alternative careers, you will need to develop means of suggesting occupational possibilities. Whatever means you adopt, you will find it helpful to encourage the student to mark his percentile ranks on the profile on page 4 of his **Student's Booklet**. Marking in red pencil will help the student to visualize his relationship to the career profiles more clearly. You will need to use your ingenuity in proceeding from here.

Table 3

TESTS THAT YIELD SCORES ROUGHLY EQUIVALENT TO THOSE YIELDED BY THE TALENT INTEREST SCALES

NAME OF TALENT INTEREST SCALE	COMPARABLE SCALE IN STRONG VOCATIONAL INTEREST BLANK FOR MEN, AGE 16, 1927-71	COMPARABLE SCALE IN STRONG VOCATIONAL INTEREST BLANK FOR WOMEN, AGE 16, 1927-1971	COMPARABLE SCALE IN KUDER PREFERENCE RECORD--VOCATIONAL: GRADES 9-16 AND ADULTS, 1934-62 (Separate percentiles for males and females)
P-701 Physical Science, Engineering, Math	Basic Interests Test--Mathematics Occupational Group 2--Physical Science	Basic Interests Test--Physical Science	Scientific
P-702 Biological Science, Medicine	Basic Interests Test--Medical Service Basic Interests Test--Nature Occupational Group 1--Biological Science	Basic Interests Test--Biological Science	Scientific
P-703 Public Service			
P-704 Literary-Linguistic	Occupational Group 10--Verbal-Linguistic	Occupational Group 3--Verbal-Linguistic	Literary
P-705 Social Service	Basic Interests Test--Social Service Occupational Group 5--Social Service	Basic Interests Test--Social Service Occupational Group 4--Social Service	Social Service
P-706 Artistic	Basic Interests Test--Art Occupational Group 6--Aesthetic-Cultural	Basic Interests Test--Art Basic Interests Test--Performing Arts Occupational Group 2--Art	Artistic
P-707 Musical	Basic Interests Test--Music	Basic Interests Test--Music Occupational Group 1--Music-Performing	Musical
P-708 Sports		Basic Interests Test--Sports	Outdoor
P-709 Hunting and Fishing			Outdoor
P-710 Business Management	Basic Interests Test--Business Management Occupational Group 11--President, Manufacturing Concern	Basic Interests Test--Merchandising Occupational Group 8--Business	
P-711 Sales	Basic Interests Test--Merchandising Basic Interests Test--Sales Occupational Group 9--Sales		Persuasive
P-712 Computation			Computational
P-713 Office Work	Basic Interests Test--Office Practices Occupational Group 8--Business and Accounting	Basic Interests Test--Office Practices	Clerical
P-714 Mechanical-Technical	Basic Interests Test--Mechanical Basic Interests Test--Technical Supervision Occupational Group 3--Technical Supervision	Basic Interests Test--Mechanical	Mechanical
P-715 Skilled Trades	Occupational Group 4--Technical and Skilled Trades		
P-716 Farming	Basic Interests Test--Agriculture		
P-717 Labor			

TABLE 4

TESTS THAT YIELD SCORES ROUGHLY EQUIVALENT TO SCORES ON THE TALENT ABILITY TESTS

	Equivalent Tests		
TALENT Ability Test	Differential Aptitude Test	Flanagan Aptitude Classification Test	General Aptitude Test Battery
Total English	7II - Sentences	13 - Expression	-
Reading Comprehension	-	7 - Judgment and Comprehension	-
Creativity	-	11 - Ingenuity	-
Mechanical Reasoning	5 - Mechanical Reasoning	2 - Mechanics	-
Visualization in 3D	4 - Space Relations	6 - Assembly	3 - Three-Dimensional Space
Abstract Reasoning	3 - Abstract Reasoning	-	-
Arithmetic Reasoning	-	4 - Reasoning	6 - Arithmetic Reasoning
Introductory Math	-	-	-
Arithmetic Computation	2 - Numerical Ability	10 - Arithmetic	2 - Computation

TABLE 5

GIRLS, 12th grade
Percentile

	1	10	25	50	75	90	99
All A's							X
Mostly A's						X	
Mostly A's & B's				X	X		
Mostly B's & C's			X				
Mostly C's & D's		X					
Mostly D's or below	X						

BOYS, 12th grade
Percentile

	1	10	25	50	75	90	99
All A's							X
Mostly A's						X	
Mostly A's & B's					X		
Mostly B's & C's			X	X			
Mostly C's & D's		X					
Mostly D's or below	X						

One way to proceed is to choose the career group whose number is closest to the student's own rankings most frequently and focus on occupations in that career group. If the student's rankings are close to several career groups, it will be a good idea to explore the student's interest in each. However, you should not rule out occupations in other career groups. As indicated above, individual variability within an occupation means that a student can frequently be below or above average for an occupation and still enter and be successful in that occupation. At the outset all career groups should be considered within the realm of possibility for an undecided student. You will find, as you talk with the student about his profile and the career groups, that a number of his low interests are really good indicators of occupations he would not consider under any circumstances. In addition, a number of his developed or developing information and ability areas will be suggestive of what the student ought to consider. With care, the student's profile on page 4 of his booklet will help the undecided student reach tentative decisions about career groups he would like to consider further.

The student can identify the career group to which a number on page 4 refers by looking at page 3 of his **Booklet**. For example, if there are more 7's than anything else near the red marks for the student's percentile rankings, then Career Group 7 — Technical Positions — is one group which might contain a suitable occupation for him.

After a possible career group has been selected, the next task is to see which of the occupations within that career group best fit the student's pattern of interests, aptitudes, and abilities. To do this, have him enter his percentile rankings (in colored pencil) on the profile in the **Student's Booklet** for the particular career group he has selected. For example, the profile for Career Group 2 is on page 6 of the **Booklet**. The letters on the profile refer to the occupations within the career group. (You can tell which occupations they refer to by looking at page 3 of the **Student's Booklet**, or the second page in Chapter 4 below.) If the letter **d** — nursing — often appears next to the student's own percentile entries, then nursing should be added to the set of occupations to be explored further. It must be emphasized that these are **not** the **only** occupations the student should consider. The purpose of the **Career Data Book** is primarily to increase the student's information, not to limit his alternatives.

A second method of generating a set of occupations to investigate is to use the tables in Appendix D. Lists of the 25 occupations at the high and low extremes are provided for each of the more important profile scales. In order to use these tables, first note the scales on which the student scores relatively quite high or quite low. There may be only one such scale or there may be several. Scales with extreme values are the clearest indicators of how the student differs from the average, and if he matches occupations on these scales, the other less extreme scales are probably of relatively little importance. For the scales noted, look in the tables in Appendix D for occupations to investigate. If there are several scales, you may find no occupation which is on all of the lists you look at, so you will have to use your judgment in choosing occupations that appear to be high on the lists most often.

The number of occupations you list to consider in detail will be determined partly by the breadth of the student's interests and abilities and partly by the amount of time available to you and the student to compare his profile with those in the **Career Data Book**.

Determining How Well an Occupation Matches a Student

Each of the specific occupations to be considered should be considered separately, with the realization that several may be perfectly appropriate for the student. The counselor should avoid telling the student that he **cannot** enter an occupation but instead help him to interpret the evidence in terms of the decisions confronting him.

The first step is either to have the student read the description of the occupation in the **Career Data Book**, or to summarize it for him. For some occupations, it will be apparent from the verbal description that the occupation is not right for the student; for others, it is useful to see how well the occupational profile matches the student's profile.

The second step — matching occupational and student profiles — is the most difficult step both to define and to accomplish. To propose that the distances be measured on each scale and the results added up would be wrong for many reasons. An attempt to do this should be avoided; some scales are more important than others for particular occupations; the distances would all be relative to the variability of the scores; scales on which the student is higher than the mean for the occupation have a different meaning from those on which he is lower and the student should not be discouraged at all from considering occupations in which he would be expected to excel; and, finally, without a computer it would just be too time-consuming to add up all the distances. For these reasons, a sequence of "cookbook" steps is provided below which can be used to roughly determine the degree of match. These should be moderated by common sense in actual application.

(1) If the occupation matches **none** of the student's highest interests, the match cannot be good. (By "match" we mean going in the direction of, **not** matching in precise value.)

(2) For each ability or information scale measure whose mean for the occupation is **very high** (above the 75th percentile), the student's score should not be lower than ten percentile points below the occupational mean.

(3) For each ability or information scale measure whose mean for the occupation is **moderately high** (between the 55th and 75th percentiles), the student's percentile rank should not be below the 25% point (i.e., to the left of the left end of the horizontal line).

In addition to applying these rules the student should be encouraged to compare his profile informally with any occupations in which he is interested. In using an occupational profile in the **Career Data Book**, the student should be helped to realize that the horizontal line on each scale indicates the variability of scale values within that occupation. Explain to the student that each horizontal line of the profile includes the **middle** 50% of the people. It is more useful to know this middle 50% range than it is to know the entire range of scores, because on most tests there are some people who score very high and some who score very low. Twenty-five percent of the people entering or preparing to enter the occupation are beyond the left end of the horizontal line (with lower scores) and 25% are beyond the right end of it (with higher scores). So if your student scores below the mean for some of the characteristics on the profile, but within the horizontal line, it does not indicate that he is unfit for the occupation concerned. Although he may have difficulty becoming one of the more successful members of the occupation, he is still in the middle part of the distribution. If his score falls beyond the left end of the horizontal line but he is well motivated for the occupation, you can point out to him that 25% of those who entered or were preparing to enter the occupation had similar scores, and that he should try to improve his scores.

You should always remember that there is a large amount of individual variability in any occupation. The profile for each occupation in the **Career Data Book** provides indications of that variability. You should share this information with the student, thereby helping him to understand how his own scores compare with those of students who entered or were about to enter the occupation he is considering. Evidence presented in Appendix B indicates, in fact, that the prediction of exact careers is not nearly so valid as prediction of career groups.

You can have him take the chart in his booklet for the career group which contains the occupation he is considering — on which he has already entered his percentile rankings — and compare it with the profile for that occupation in the **Career Data Book**. Allow him to examine the horizontal lines on the profile and compare them with his own ratings. If there are scales for which the student's percentile rank is so low that they are beyond the left end of the horizontal line, special note should be taken of these scales. These are the scales for which the student's values are "unusually" low, relative to people in the occupation; fewer than one out of four have values as low as his (that is, beyond the left end of the line). Again, common sense should be used in interpreting these low scores. Some scales indicate abilities that are difficult to increase, but with effort many scale values could be changed, and the student should be made aware of this. If only one percentile rank is low, the inference to be made is not the same as if several values are low. It is a lot easier to make up a single deficiency than several. Finally, if none of the ranks are "unusually" low but many are more than ten percentile points below the mean, the student is not going to have an easy time in that occupation, especially if he wants to be one of its more successful members.

Advising the Student After Profile Comparisons

After comparing a student's profile with occupational profiles, the counselor and the student will have a better idea of what careers are promising. What more should be done? This depends, of course, on the individual case. If the student is satisfied with a suggestion about an occupation, the counselor should encourage him to find out as much as he can about it and should provide him with methods for obtaining such information, not only from books but also from people in the community. The counselor may be able to provide films about the occupation, to suggest relevant extracurricular activities, and to direct the student toward relevant summer employment. "Shadowing" a person on the job, observing what he does, and asking questions when time permits is a useful activity for the student. Whenever a person in the community is used as a resource, an effort should be made to insure his cooperation and to explain to him the nature of the questions confronting the student. The student should be encouraged to return to see the counselor if he changes his mind, in order for him to explore other occupations, and in order for the counselor to determine the reasons for the change of mind.

If the student is very interested in an occupation but finds that he does not meet the ability requirements, the counselor should suggest ways in which he might try to improve his abilities — by taking special courses, and so on. On the other hand, the student should be probed to find out why his interest does not correspond with his abilities, and, to broaden his horizon, he should be encouraged to explore careers for which he might be better suited.

What the counselor can offer the student is information. Counselors should not make decisions for students; they should point out what decisions students must make themselves and try to provide as much help as possible in evaluating the alternatives. In addition to the **Career Data Book** and the **Occupational Outlook Handbook**, there are many other sources of information which the guidance counselor should have available for students. Among them are those listed below.

Hopke, William E. **Encyclopedia of Careers and Vocational Guidance**. Vols. I and II. Garden City, N. Y.: Doubleday, 1972.

Hoppock, R. **Occupational information: Where to get it and how to use it in counseling and in teaching.** (Third edition) New York: McGraw-Hill, 1967.

Lang, C. J. (ed.) **Handbook of job facts.** (Fifth edition) Chicago: Science Research Associates, 1972.

Shertzer, B. E. **Career exploration and planning.** Boston: Houghton Mifflin, 1973.

Counselor's Information Service (quarterly). B'nai B'rith Career and Counseling Services, Washington, D. C.

Occupational Exploration Kit. Chicago: Science Research Associates, 1973.

SRA Guidance Service. Chicago: Science Research Associates, 1973.

Career Information Service. Bureau of Vocational Education, Department of Education, Commonwealth of Massachusetts, Boston, 1968.

Two Sample Cases

We conclude this chapter with two sample cases to illustrate uses of the **Career Data Book**. Although the names are fictional, the rest of the information is based on data collected by Project TALENT.

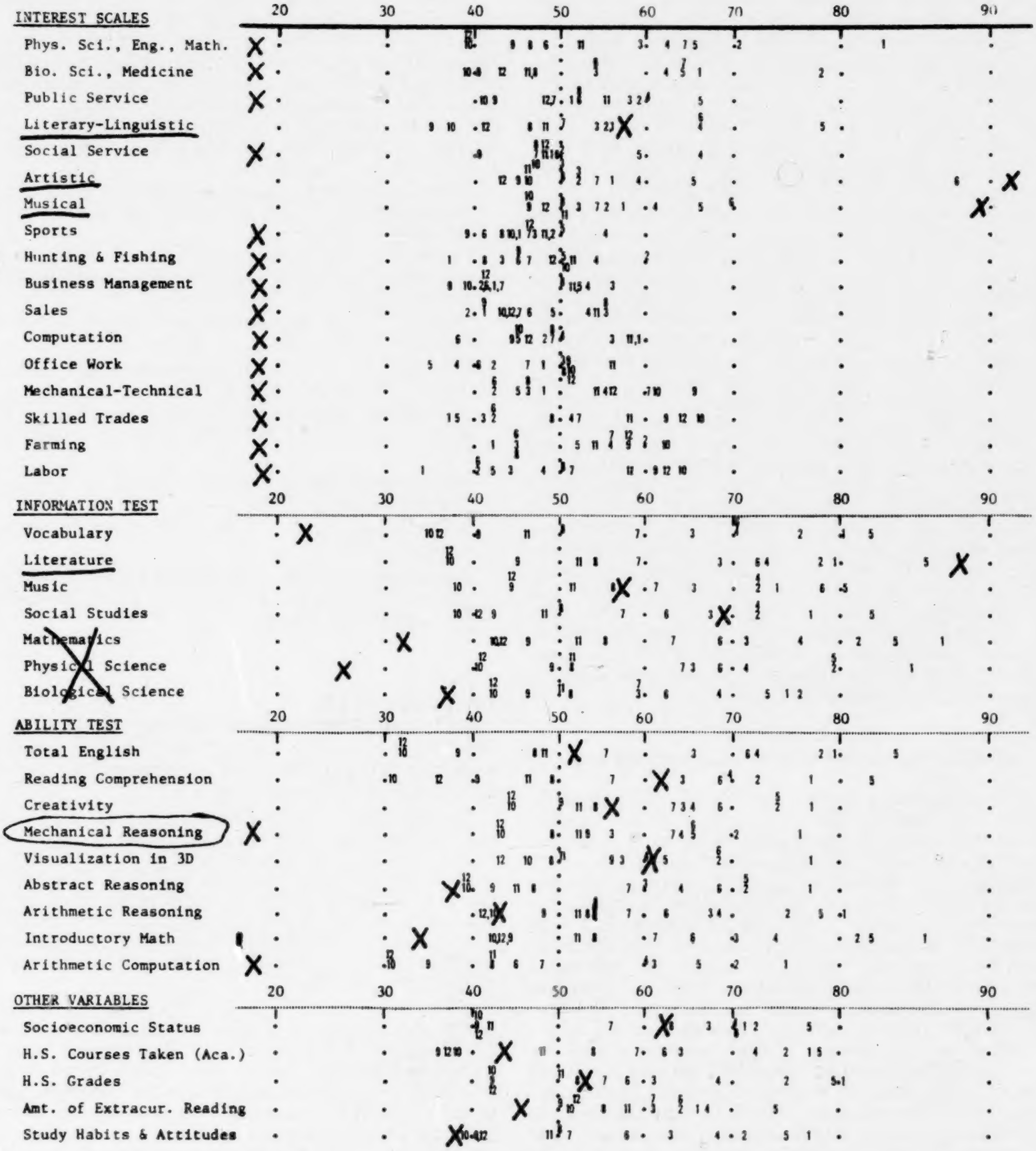
The first case is that of Don, who has a definite career interest that may not be rewarding. Don is a high-school senior. His father is a foreman in the local steel mill and there are three other children in his family. Don has been taking a college-preparatory curriculum but does not particularly want to go to college, though he would like to take art courses. He has taken some art courses in high school and made mostly A's and B's in them. He has also played in the high school band.

After Don plotted his test profile (Figure 6), he and his counselor examined it, looking first at the interest section. The counselor first noticed a very high interest in art and music, and the fact that the only other interest score in which Don was above average was for literary-linguistic interest, which is somewhat related to art. In all other fields his interest level was extremely low. The counselor pointed out to Don that his expressed range of interests was unusually narrow, and knowing that art can be an economically unrewarding profession, suggested that Don examine other possibilities.

The counselor examined Don's abilities and information profile to determine which career groups were counterindicated by the profile. The counselor noticed a large

Figure 6

EXAMPLE PROFILE OF "DON"



discrepancy between the vocabulary and literature scores and asked Don why he thought this was so. The counselor pointed out to him that careers in which he might use his literary interest and ability commonly require a reasonably large vocabulary. The counselor noticed that Don's information about sciences matched his low interest and therefore ruled out exploring a career in science. The counselor also saw that Don's ability scores on mechanical reasoning and arithmetic computation appeared to be very low and made a note to check these scales on any occupation to be investigated.

From a comparison of the profile of Don's interests with the combined career groups profile (Figure 4), it appeared that Career Groups 4, 5, and 6 were worth exploring first. The counselor asked Don to look over the occupations in these career groups on page 3 of his **Student's Booklet**. Although Don said that being an artist was his only interest, the counselor pointed out to him that preparing to become an art teacher, a commercial artist, or an illustrator might provide a stabler basis for progressing in art than setting the goal of supporting himself solely through the sale of his paintings.

Within the teaching fields, in Career Group 4, and for artists, in Career Group 6, most of the profiles are for female norms. The counselor pointed out to Don that although the majority of teachers and artists are women, there was no reason why he should not enter one of these careers. He helped Don work out his scores according to female norms. The counselor asked him to mark his percentiles for the appropriate sex on the profiles in his **Student's Booklet** for Career Groups 4, 5, and 6. Don did so for Career Groups 4 and 6, but did not find any occupations in Career Group 5 interesting.

In Career Group 4, the counselor pointed out that school teachers (letters "g," "h," "i") tended to be interested in art, although not generally as much as Don. Don saw that his ability scores were generally lower than the means for all occupations in Career Group 4. The counselor, in order to allay Don's worries about this, turned to the profile for elementary school teachers and showed him that most of his ability scores were in the middle 50% of the distribution (within the ranges indicated by the horizontal lines).

In Career Group 6, Don showed more interest. The counselor reinforced this by pointing out that his interests and abilities matched fairly well the "personal characteristics" described on the first page of the chapter on Career Group 6. The counselor pointed out that there were several different occupations in the career group that were suitable, and that he would find people with interests similar to his own in each of the occupations. The counselor also directed him to further sources of information on the necessary preparation and the characteristics of the job market for each of the different occupations in the career group. The counselor called a local firm that employs commercial artists and made an appointment for Don to talk with an employee. Finally, the counselor told Don that although they had only looked at two career groups, he was welcome to come in and look at the occupational characteristics of any of the occupations listed in his **Student's Booklet**, and suggested that he think about ways in which he might mix his abilities and interests in art and literature.

* * *

The second case concerns a hardworking student whom we shall call Pat. She received rather low grades in school and said she did not want to go to college because she was tired of studying. She wanted to choose an occupation which would not require much training beyond high school. Her family was well-to-do, and she did not plan to work if she married.

Pat and the counselor looked over the percentile ranks she had entered into the career groups profile on page 4 of the **Student's Booklet**. (See Figure 7.) Because Pat did not have a clear preference for any occupation, the counselor set out to find occupations that matched the peaks and valleys of her interests and abilities, not attempting to find exact matches but merely similarities of trend. At the same time, the counselor saw the exceptionally low reading comprehension score relative to Pat's other abilities and made a note to pursue the possibility that Pat had a reading disability that special training could remedy. The counselor asked Pat to read and comment on a newspaper article and noticed that she was able to do so, and therefore decided to retest Pat on reading comprehension to try to find out why she scored so low and to re-estimate her score.

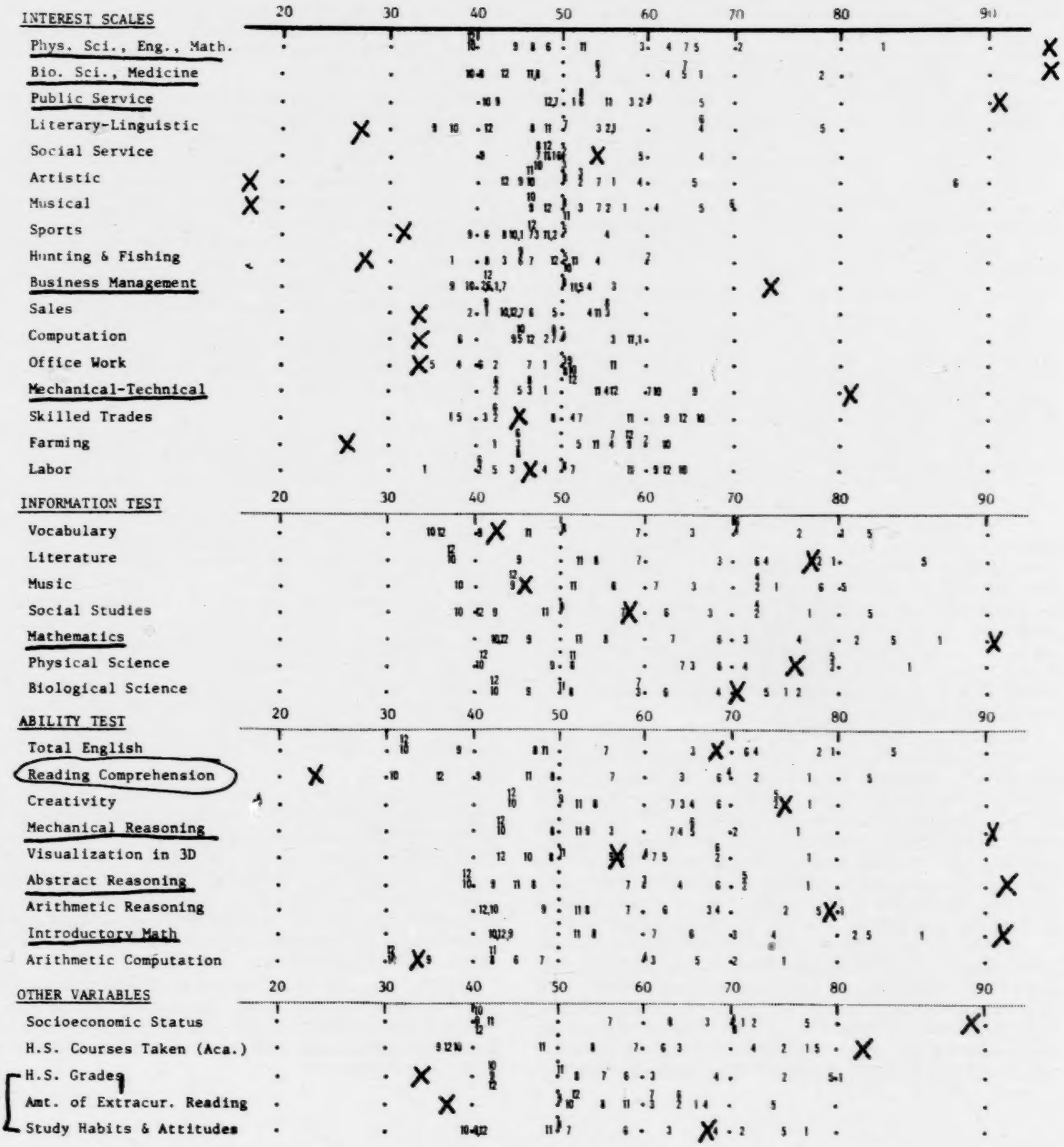
Because of Pat's interest in science and lack of motivation for extensive training, the counselor looked at the occupations in Career Group 7. The counselor saw that medical laboratory technicians (letter "h") have personality characteristics that are very similar to Pat's. Her low interests in art and music were meaningless in this context; however, her low reading comprehension and arithmetic computation abilities were worth considering further. In looking at the profile for medical laboratory technicians, the counselor found that Pat's low scores were not beyond the range of the middle 50% of the technicians. The counselor enthusiastically suggested that Pat should look over her resource information on medical technicians. The counselor pointed out that Pat should not confuse "technician" with "technologist" — a technologist's job required a greater educational commitment.

Pat asked whether being a nurse was the same as a medical technician, and the counselor, after referring Pat to the appropriate occupational descriptions in the **Career Data Book** (nurse, Career Group 2; practical nurse, Career Group 12), pointed out that Pat had ability that might be wasted as a practical nurse, and was probably not ready to undertake the commitment to become a registered nurse. The counselor suggested that Pat consider a career as a registered nurse an alternative for the present.

Finally, the counselor pointed out that because of limited time they had only briefly looked for occupations for Pat and that she should feel free to examine the **Career Data Book** in the counselor's office for other occupations, if she felt it desirable.

Figure 7

EXAMPLE PROFILE OF "PAT"



Section II
Data

See page 361 (Appendix C) for index of occupations.

CHAPTER 3

CAREER GROUP 1

Engineering, Physical Science, Mathematics, and Architecture

Occupations in Career Group 1 involve both mathematical and scientific abilities. Persons working in these occupations apply the principles of physical science and mathematics to many different fields. They may work in research areas or in areas of practical application. Physical scientists, for example, do research with non-living or inorganic materials. Engineers apply their knowledge and experience to developing economical ways of using the raw materials and the forces of nature for the benefit of mankind.

The occupations included in Career Group 1 with their respective codes on the Career Group profile are:

- Architect (A)
- Chemist (B)
  - (also see Science Teachers)
- Engineers (not elsewhere classified) (C)
  - Aerospace (D)
  - Chemical (E)
  - Civil, Hydraulic (F)
  - Electrical, Electronic (G)
  - Mechanical, Automotive (H)
- Geologist (I)
- Mathematician, Statistician (J)
  - College Mathematics Teacher (K)
  - High School Mathematics Teacher (Females) (m)
- Physical Scientist (not elsewhere classified) (N)
- Physicist (O)
  - (also see Science Teachers)
- Science Teachers
  - College Science Teacher (P)
  - High School Science Teacher (R)

These occupations all require at least four years of college or university with many courses in science and mathematics.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (80th percentile) in physical science, engineering and math; high (65th percentile) in biological science; lowest (34th percentile) in hunting and fishing, skilled trades, and labor.

Information

General: Average around 80th percentile on information scores; highest (85th percentile) in mathematics; lowest (75th percentile) in music and biological science. Career Group 1 also showed a secondary high in physical science.

Specific: High (76th percentile) in aerospace, and electricity and electronics; 65th percentile in engineering; 62nd percentile in mechanics; 70th percentile in scientific attitude.

Abilities

General: Around the 80th percentile on ability scores; highest (85th percentile) in introductory math; lowest (70th percentile) in arithmetic computation.

Specific: High (85th percentile) in advanced math; 72nd percentile in memory for words; 65th percentile in table reading.

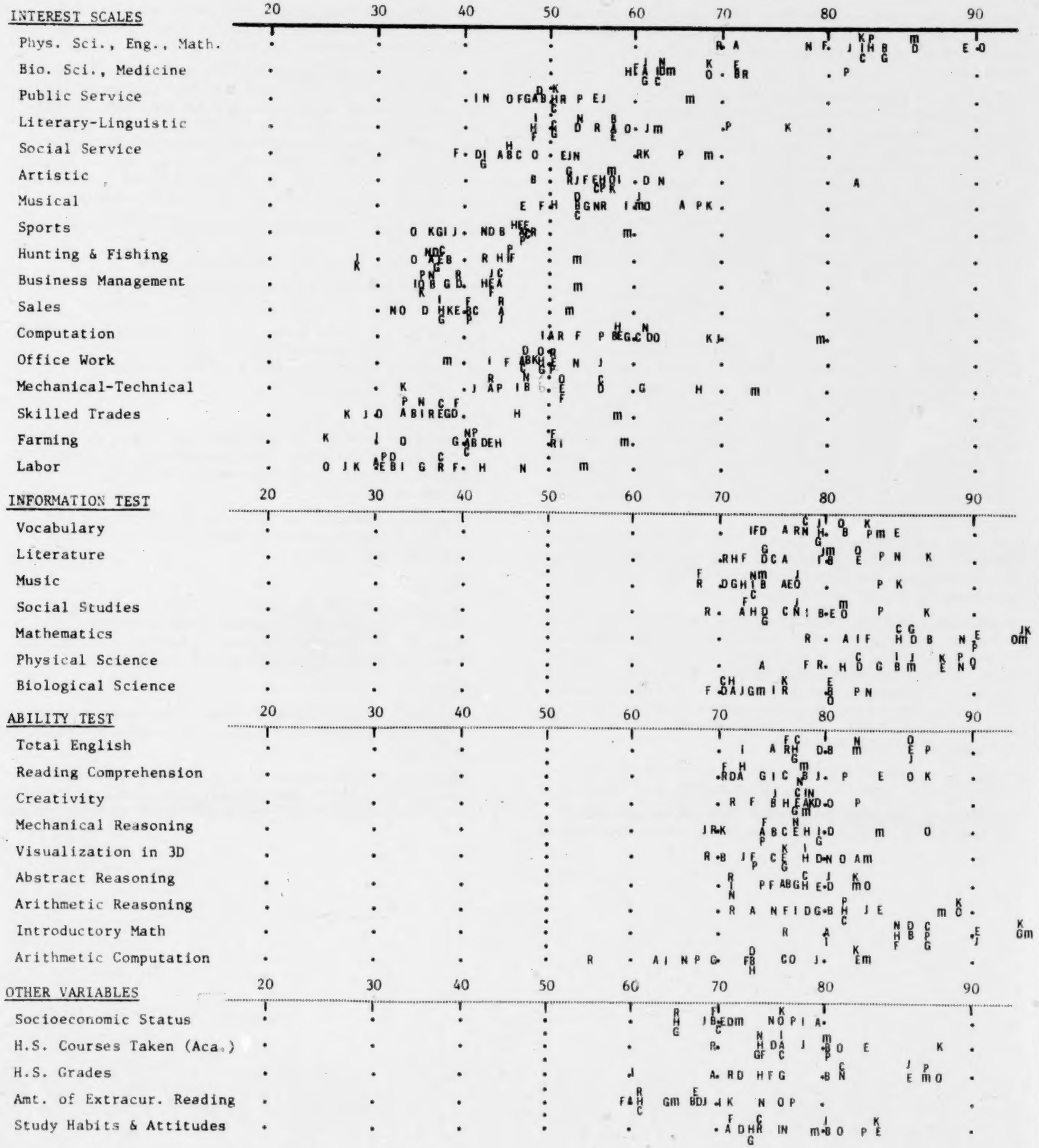
Others

General: High (75th percentile) in academic orientation of high school courses, high school grades, and study habits and attitudes; low (62nd percentile) in extracurricular reading.

Specific: 42nd percentile in sociability; 55th percentile in social sensitivity; 60th percentile in self-perception of reading skills.

CAREER GROUP 1

Engineering, Physical Science, Mathematics, and Architecture



ARCHITECT

Importance: Good architecture increasingly essential as U. S. turns to urban living. Architecture determines safety and convenience as well as beauty of buildings.

Training: A high-school student who plans to be an architect should study mathematics, science, social sciences, languages, and art. Bachelor's degree in architecture usually requires five years of study. Graduate training often helpful for research or teaching. To practice architecture must have state license; licensing requirements vary from state to state but include examination and usually 3 years of architectural practical experience. Most states will waive requirement for formal training if applicant has 10-12 years of practical experience.

Work Activities: Plans, designs, and supervises building of structures such as homes, hospitals, skyscrapers, airport terminals, schools, factories. These must be designed so that they are stable and safe, conform to building codes and legal requirements, and stay within cost limits. In the course of planning, detailed drawings of the planned structure are made and lists of materials drawn up. Architect also checks on progress of the actual building of the structure. Must plan structure so that federal, state, and local building codes are observed. Must consider needs and wishes of user and purpose building is to fulfill.

Modern architects interested in ways in which structures we live and work in determine our lives, and in urban planning and ways to improve urban environment by planning entire communities.

Beginning architect usually begins as draftsman; makes drawings and models. May specialize in drafting, designing, writing specifications, checking on construction, or in some particular type of building. If successful often goes into business for self. About two-fifths self-employed. Others work mainly for architectural firms; some for government agencies and building materials companies.

Outcomes: Safe structures suited to needs of purchaser, constructed within agreed-upon cost limits.

Supervision; Social Relations: Beginning architect supervised by senior draftsman, etc. Many experienced architects self-employed. Architect must maintain good relations with clients and prospective clients. Salesmanship important in architecture.

Salary; Other Benefits: In 1970 architects in private industry began at $120-$160 a week. Draftsmen with 3 or more years of experience earned $135-$180 a week, senior employees $150-$250 a week. In federal government, inexperienced architects with bachelor's degree started at $8,510 or $10,528. With master's, $10,528 or $11,855; with Ph.D. $13,493 or $14,665. Architects in good private practice may have high earnings.

Role of Sexes: About 4% of architects women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (82nd percentile) in artistic; high (71st percentile) in physical science, engineering and math; lowest (32nd percentile) in skilled trades, and labor.

Information

General: Average around 76th percentile on information scores; highest (81st percentile) in mathematics; lowest (71st percentile) in biological science.

Specific: 80th percentile in art; 76th percentile in architecture; 69th percentile in accounting, business and sales.

Abilities

General: Around the 75th percentile on ability scores; highest (81st percentile) in three-dimensional visualization, and introductory math; lowest (63rd percentile) in arithmetic computation.

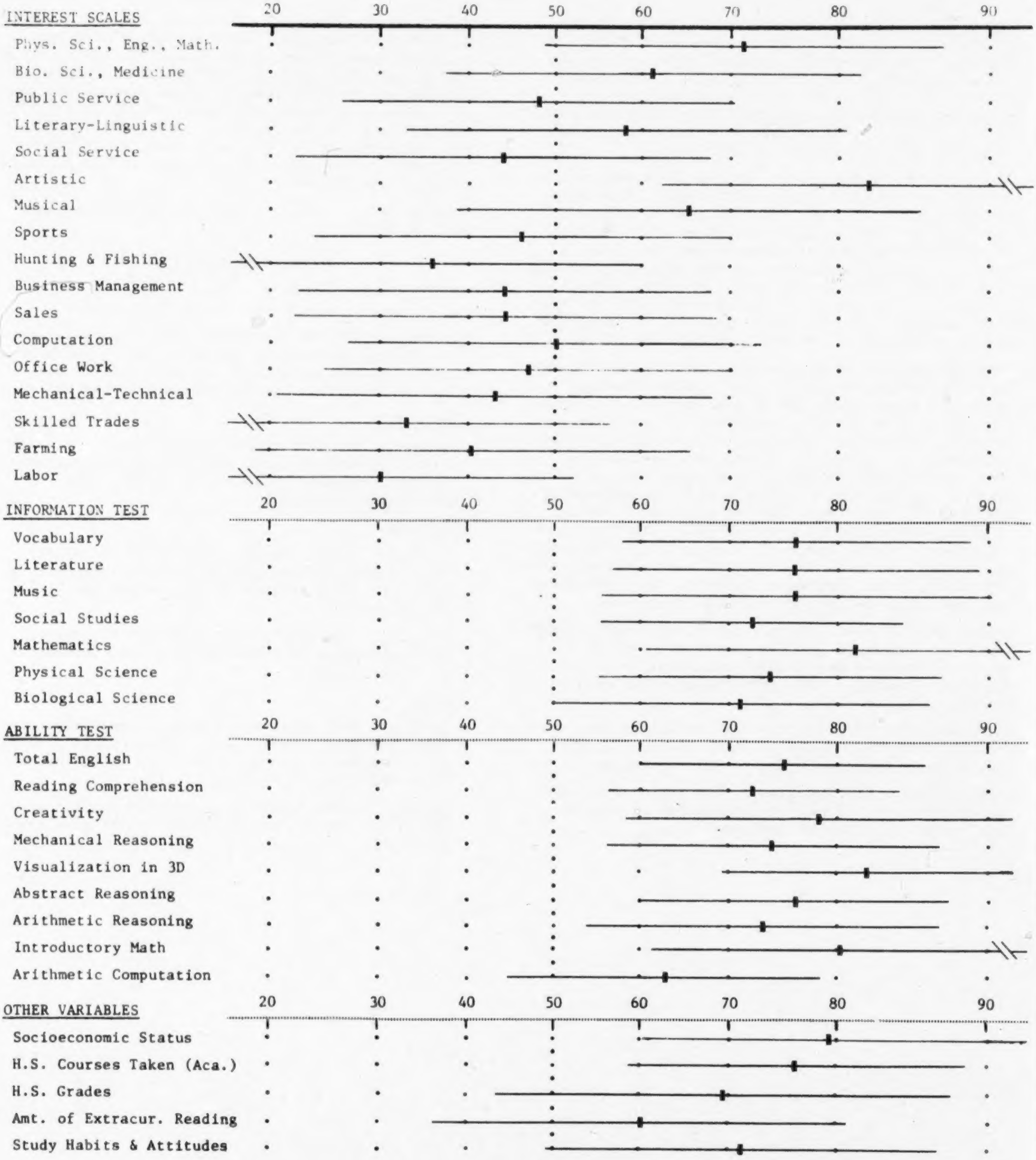
Others

General: High (79th percentile) in socioeconomic status; low (60th percentile) in extracurricular reading.

Specific: 49th percentile in sociability; 60th percentile in social sensitivity, and self-confidence; 54th percentile in self-perception of reading skills.

ARCHITECT

(Male - n = 190)



CHEMIST

Importance: More scientists work in chemistry than in any other physical science. Most objects and substances in use made by chemical processes or subjected to them. Chemistry increasingly important as natural substances scarcer. Food production and preservation involves chemistry; most medicines products of chemistry. Some entire industries, such as plastics, owe their origin to chemistry.

Training: Needs liking for math and science, good eyesight and ability to work with hands. Chemistry student should also take math and physics courses. Must have at least bachelor's degree with major in chemistry; graduate work required for many jobs. Master's usually needed for applied research positions. Ph.D. usually required for basic research, better college teaching jobs, or top administrative positions. Many employers give on-the-job training in particular branch of chemistry for which employee was hired.

Work Activities: Chemist studies matter and the ways in which substances combine, and applies chemical knowledge to practical use in such processes as manufacturing. Develops new substances and synthesizes existing substances; examines behavior and effect of substances in various situations and combinations. Some work on basic research to discover new facts, some on application of chemical facts already known. Analyzes and tests materials and products. Most chemists specialize in some particular branch of chemistry. May be aluminum, atomic, drug, electronics manufacturing, industrial chemical manufacturing, iron and steel, paper, petroleum chemists. As biochemists may specialize in chemistry of life processes.

Nearly two-fifths of chemists in research and development; many others in applied research. Over one-fourth in management and administration, about one-tenth in teaching. About three-fourths employed by private industry.

Outcomes: Discovery of new facts regarding matter and its behavior; application of these facts to manufacturing, medicine, extraction of natural resources, etc.

Supervision; Social Relations: May begin by assisting senior chemists. Amount of supervision depends on type of job and place of employment.

Salary; Other Benefits: In private industry in 1970, chemists with bachelor's degree started at median salary of about $9,400 year; those with master's but inexperienced at about $11,000; Ph.D.'s at about $15,000. In federal service, inexperienced chemists with bachelor's degree started at $8,292 or $10,258. With one year of graduate study started at $10,258, with two years at $11,526, with Ph.D. at $13,096 or $14,192. Median salary of all chemists in government register was $15,300.

Role of Sexes: Mainly a man's field but some women work as chemists.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (84th percentile) in physical science, engineering and math; high (71st percentile) in biological science and medicine; lowest (33rd percentile) in skilled trades, and labor.

Information

General: Average around 80th percentile on information scores; highest (86th percentile) in mathematics, and physical science; lowest (74th percentile) in music.

Abilities

General: Around the 76th percentile on ability scores; highest (86th percentile) in introductory math; low (70th percentile) in three-dimensional visualization.

Specific: 76th percentile in memory for words; 88th percentile in advanced math; 59th percentile in table reading.

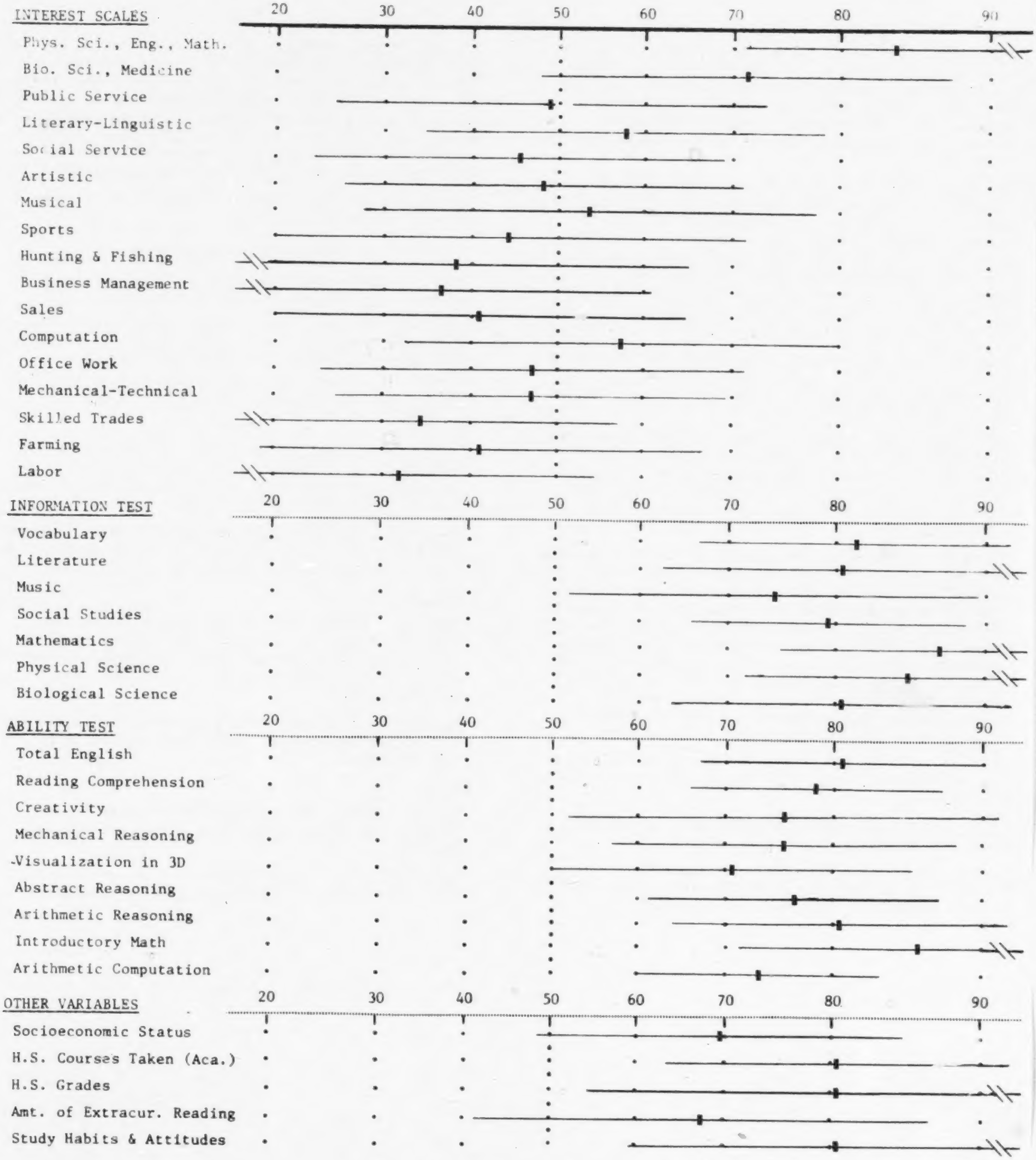
Others

General: High (80th percentile) in academic orientation of high school courses, high school grades, and study habits and attitudes; low (67th percentile) in extracurricular reading.

Specific: 57th percentile in social sensitivity; high (71st percentile) in self-perception of reading skills.

CHEMIST

(Male - n = 269)



ENGINEER (not elsewhere classified)

Importance: Engineers needed to put the findings of scientists to practical and large-scale use. Engineering often acts as link between science and manufacturing. Design goods and services and develop methods for producing them. Work of engineers necessary to business, defense, research, and standard of living.

Training: Bachelor's degree generally required, preferably in engineering but sometimes in allied subject such as physics or mathematics. Graduate degrees desirable. A few technicians and assistants become engineers without taking degrees, by on-the-job learning, night schools, private study, etc. In high school, a student planning to be an engineer should take courses in mathematics and the physical sciences and keep his work up to high standards in all courses.

There are many engineering specialties but the basic fields of study for all of them are similar. Often an engineer does not begin to specialize until after he has his bachelor's degree.

Work Activities: Engineers (not elsewhere classified) include agricultural, biomedical, ceramic, metallurgical, petroleum and natural gas, mining, locomotive, oceanographic, operating and building trades, packaging, paper and allied products, and stationary engineers.

The work of engineers is primarily to extract natural raw materials and to turn them and natural power sources into usable form. Engineering usually deals with applied rather than pure research. It is one of the "useful arts." Engineer constructs buildings, highways, and dams, plans and develops new products, oversees quality control and other manufacturing and productive activities, sometimes works in business or administration that has to do with engineering. Designs and develops apparatus needed for research projects as well as useful products for consumers.

Engineers usually specialize in one of the many engineering branches. Over half of all engineers work in manufacturing.

Outcomes: Scientifically planned and successfully operating structures, devices, and processes.

Supervision; Social Relations: Beginning engineers usually work as trainees or assistants; often work without supervision when more experienced.

Salary; Other Benefits: In private industry, beginning engineers with bachelor's degrees averaged $10,400 a year in 1970; for federal government began at $8,510 or $10,528. Engineers with master's degrees averaged nearly $12,000 and Ph.D.'s about $16,000 in private industry. In federal government Ph.D.'s began at $13,493 or $14,665. Median salary of engineers with 21-23 years of experience was $18,350.

Role of Sexes: Most engineers are men, but a few women have entered the field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (82nd percentile) in physical science, engineering and math; high (61st percentile) in biological science and medicine, and computation; lowest (38th percentile) in hunting and fishing, skilled trades, farming, and labor.

Information

General: Average around 76th percentile on information scores; highest (85th percentile) in mathematics; high (82nd percentile) in physical science; low (70th percentile) in biological science.

Specific: Highest (81st percentile) in electricity and electronics; high (76th percentile) in aerospace; 69th percentile in mechanics, and engineering.

Abilities

General: Around the 77th percentile on ability scores; highest (87th percentile) in introductory math; high (81st percentile) in arithmetic reasoning; lowest (75th percentile) in three-dimensional visualization.

Specific: 74th percentile in memory for words; 87th percentile in advanced math; 72nd percentile on table reading.

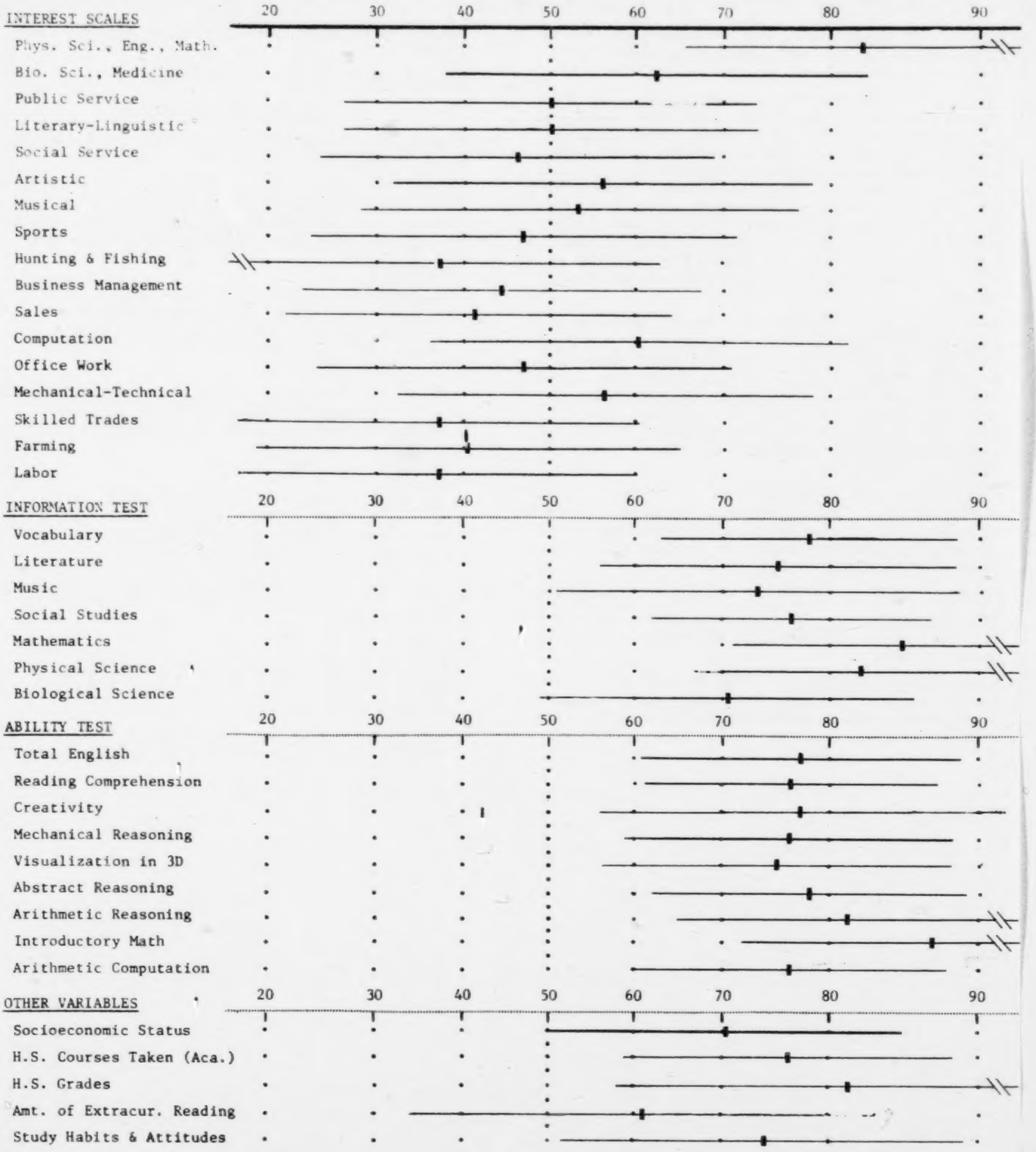
Others

General: High (82nd percentile) in high school grades; low (61st percentile) in extracurricular reading.

Specific: 58th percentile in social sensitivity; 62nd percentile in self-perception of reading skills.

ENGINEER (not elsewhere classified)

(Male - n = 651)



ENGINEER - Aerospace

Importance: Aeronautical and aerospace engineers are needed to design safe and efficient aircraft for commerce, space exploration, and national defense.

Training: Usual requirement is bachelor's degree in engineering, though people with bachelor's degrees in other physical sciences or in mathematics sometimes qualify. Some persons without a degree occasionally qualify through on-the-job training and some college courses. Graduate degrees desirable for advancement, research, and teaching. Engineering degree requires four or sometimes five years. State licensing required for most kinds of engineering; engineering degree or long experience a prerequisite. Lifetime study required to keep up with new developments in field.

Work Activities: Aeronautical engineer works on aircraft of all types; aerospace engineer on missiles, rockets, and spacecraft. Both called aerospace engineer. Plans, develops, assembles, and tests aerospace vehicles and devices. Usually specializes in some one aspect of the work, such as propulsion or structural design, or in some particular product such as satellites, cargo planes, missiles, or attack aircraft.

Most aerospace engineers work in aircraft and aircraft parts industry, some for federal government, especially National Aeronautics and Space Administration and Department of Defense, a few for consulting firms, airlines, universities, etc.

Outcomes: Safe and efficient aircraft or spacecraft.

Supervision; Social Relations: Supervised by superior in organization. Essential to be able to work as member of team.

Salary; Other Benefits: In 1969-70 aeronautical engineers averaged $10,200. Beginning engineers entering federal service started at $8,510 or $10,528 in 1970; those with a year or two of graduate work at $10,528 or $11,855; those with Ph.D. at $13,493 or $14,665.

Role of Sexes: Mainly a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (86th percentile) in physical science, engineering and math; high (62nd percentile) in biological science and medicine, artistic, and computation; lowest (32nd percentile) in labor.

Information

General: Average around 74th percentile on information scores; highest (86th percentile) in mathematics; high (82nd percentile) in physical science; lowest (70th percentile) in music, and biological science.

Specific: High (83rd percentile) in aerospace, and electricity and electronics; 66th percentile in mechanics; 71st percentile in engineering, and military.

Abilities

General: Around the 79th percentile on ability scores; highest (86th percentile) in introductory math; lowest (72nd percentile) in reading comprehension, and arithmetic computation.

Specific: 78th percentile in memory for words; 87th percentile in advanced math; 73rd percentile in table reading.

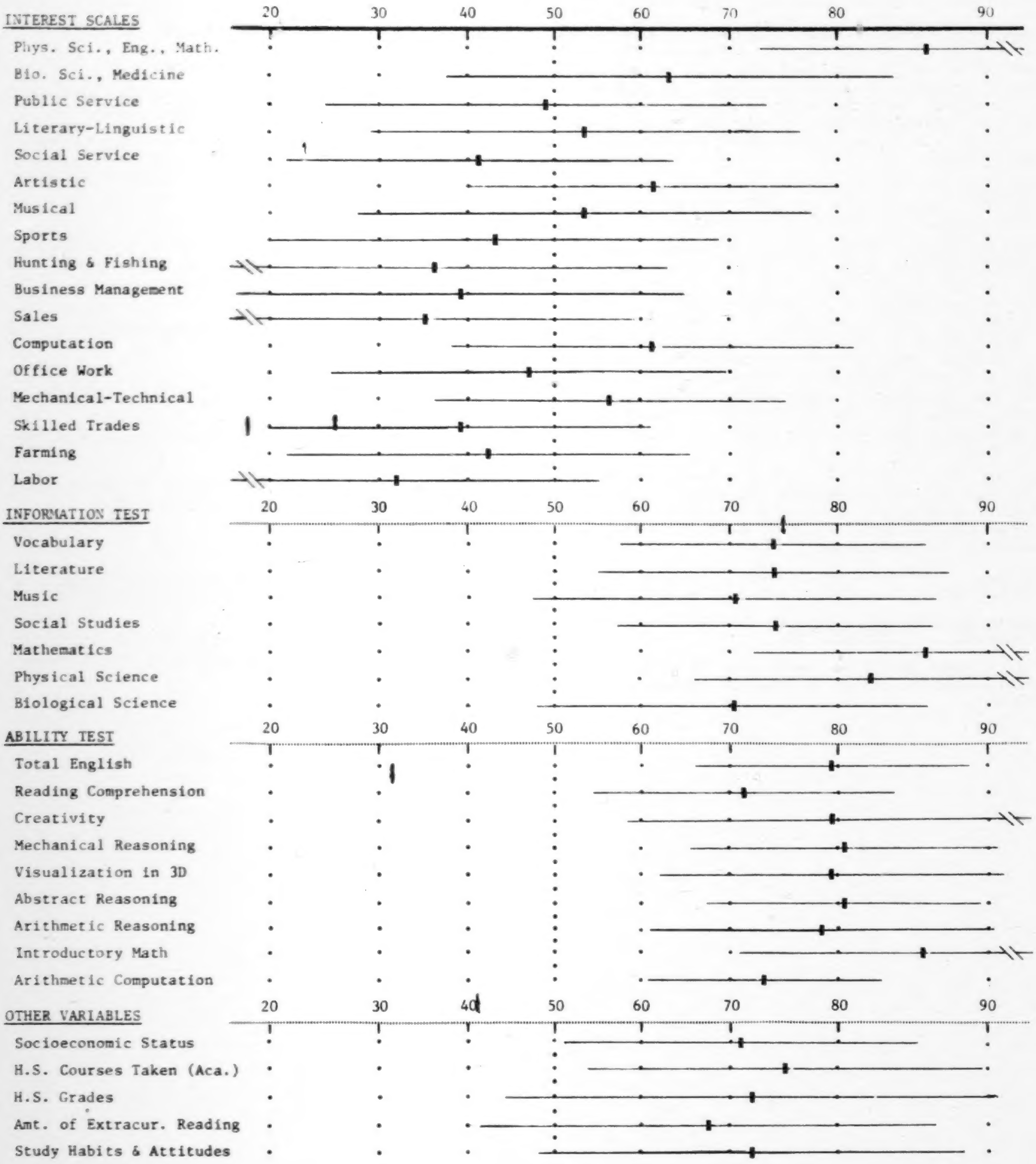
Others

General: High (75th percentile) in academic orientation of high school courses; low (67th percentile) in extracurricular reading.

Specific: 46th percentile in sociability; 63rd percentile in self-perception of reading skills.

ENGINEER - Aerospace

(Male - n = 108)



ENGINEER - Chemical

Importance: Chemical engineering puts the discoveries of chemists into practical use. Makes possible the manufacture of new substances such as nylon; develops better methods of necessary processes such as food preservation. With the decline in natural resources, chemical engineering seeks to make full use of available materials and to create substitutes for those in short supply.

Training: See pp. 30 and 28. Chemical engineers working in manufacturing also need to know physics and mechanical and electrical engineering.

Work Activities: Chemical engineers design plants which manufacture chemicals and chemical products, and help plan and monitor the process of manufacture. They may specialize in a particular kind of chemical change, such as hydrogenation, by which liquid oils are made solid, or polymerization, by which smaller particles are made to unite into the enormously large molecules characteristic of organic substances. Or they may specialize in a particular product, such as soap, artificial rubber, or plastics. Some of them work in management and sales as well as in research and development.

In 1970 about four-fifths of United States chemical engineers worked in manufacturing, mainly in the manufacture of chemicals or chemical products. Some worked for government agencies, and as teachers, researchers, and consultants.

Outcomes: Successful application of chemical facts and techniques to practical uses such as production.

Supervision; Social Relations: Dependent on place of employment and particular job.

Salary; Other Benefits: See p. 30. In 1969-70 the average starting salary for chemical engineers was $10,800.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (89th percentile) in physical science, engineering and math; high (71st percentile) in biological science and medicine; lowest (31st percentile) in labor.

Information

General: Average around 83rd percentile on information scores; highest (89th percentile) in mathematics, and physical science; lowest (76th percentile) in music.

Specific: 68th percentile in engineering.

Abilities

General: Around the 82nd percentile on ability scores; highest (90th percentile) in introductory math; lowest (77th percentile) in creativity, mechanical reasoning, and three-dimensional visualization.

Specific: 82nd percentile in memory for words; 86th percentile in advanced math; 76th percentile in table reading.

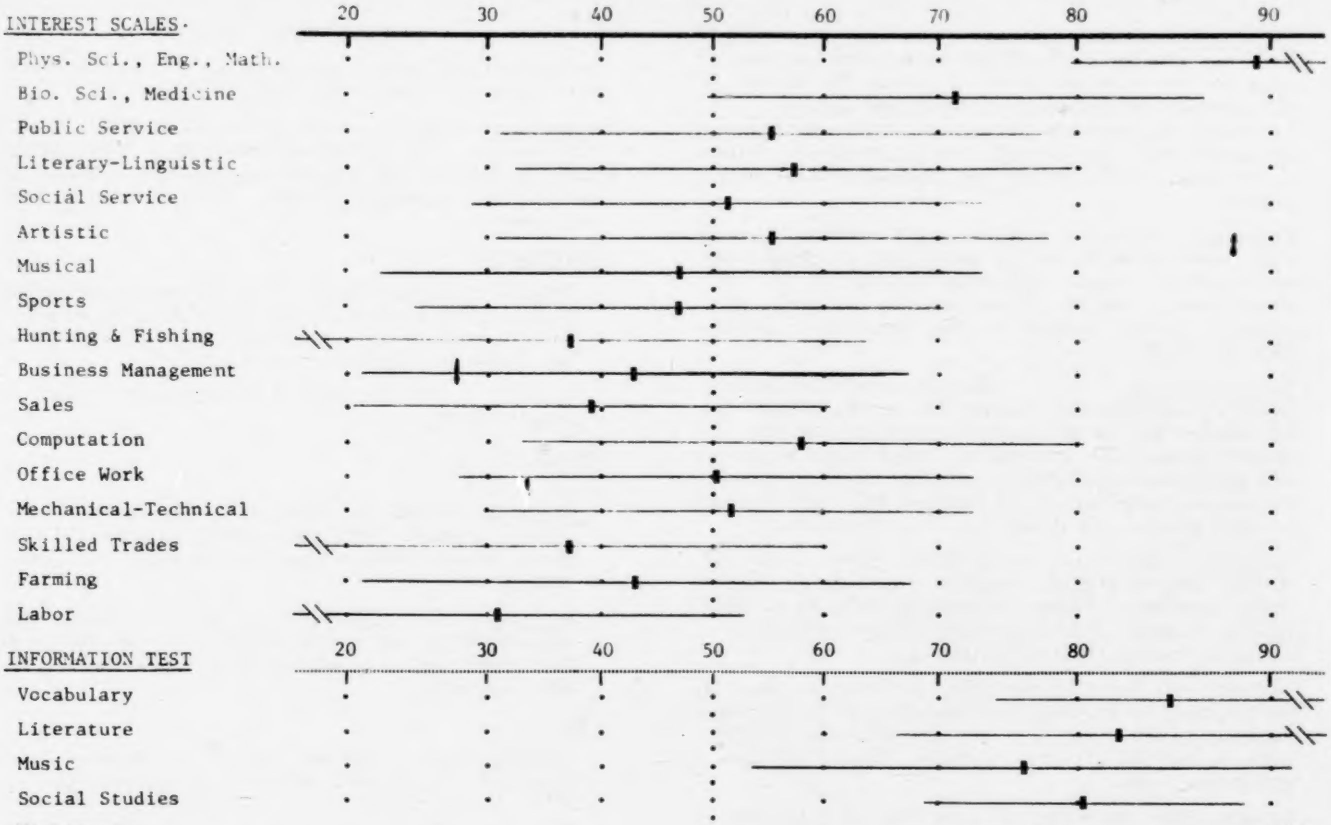
Others

General: High (86th percentile) in high school grades; low (67th percentile) in extracurricular reading.

Specific: High (74th percentile) in self-perception of reading skills; 55th percentile in social sensitivity.

ENGINEER - Chemical

(Male - n = 157)



ENGINEER - Civil, Hydraulic

Importance: Civil engineers design and supervise the building of many kinds of structures and systems, used for the transportation of people and things, and the storage and movement of water and sewage. Hydraulic engineering a branch of civil engineering, concerned with the use and control of flowing water, as in dams, canals, water and hydraulic-power supply system.

Training: Typically requires a bachelor's degree, with major in engineering, less often in physics or mathematics. Higher degrees desirable for career advancement. Courses in mathematics and physical sciences usually demanded. (See additional information on p. 30.)

Work Activities: Vary from planning with drawing board to supervising construction crews. Designing structures and systems, checking specifications for materials and work procedures. Most civil engineers are employed by government agencies or by construction companies; some work in manufacturing. Work is done in many places, sometimes in foreign countries.

Outcomes: Structural engineering: large buildings such as sports arenas. Highway engineering: highways, freeways. Hydraulic engineering: dams, irrigation systems. Sanitary engineering: sewage systems, anti-pollution systems.

Supervision; Social Relations: Design work usually done alone, or in close collaboration with colleague. Interacts with other engineer specialists, and may work as part of a technical team. Supervises construction crews.

Salary; Other Benefits: Salary high (see p. 30). The civil engineer often is responsible for his own work hours and work priorities. Opportunities for work in other countries.

Role of Sexes: Largely a man's field; a few women in office jobs.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (79th percentile) in physical science, engineering and math; high (60th percentile) in biological science and medicine; lowest (39th percentile) in social service, sales, skilled trades, and labor.

Information

General: Average around 72nd percentile on information scores; highest (83rd percentile) in mathematics; high (78th percentile) in physical science; low (67th percentile) in music.

Specific: 64th percentile in engineering, and architecture.

Abilities

General: Around the 74th percentile on ability scores; highest (85th percentile) in introductory math; lowest (70th percentile) in reading comprehension.

Specific: 73rd percentile in table reading. 72nd percentile in memory for words; 67th percentile in two-dimensional visualization; 84th percentile in advanced math.

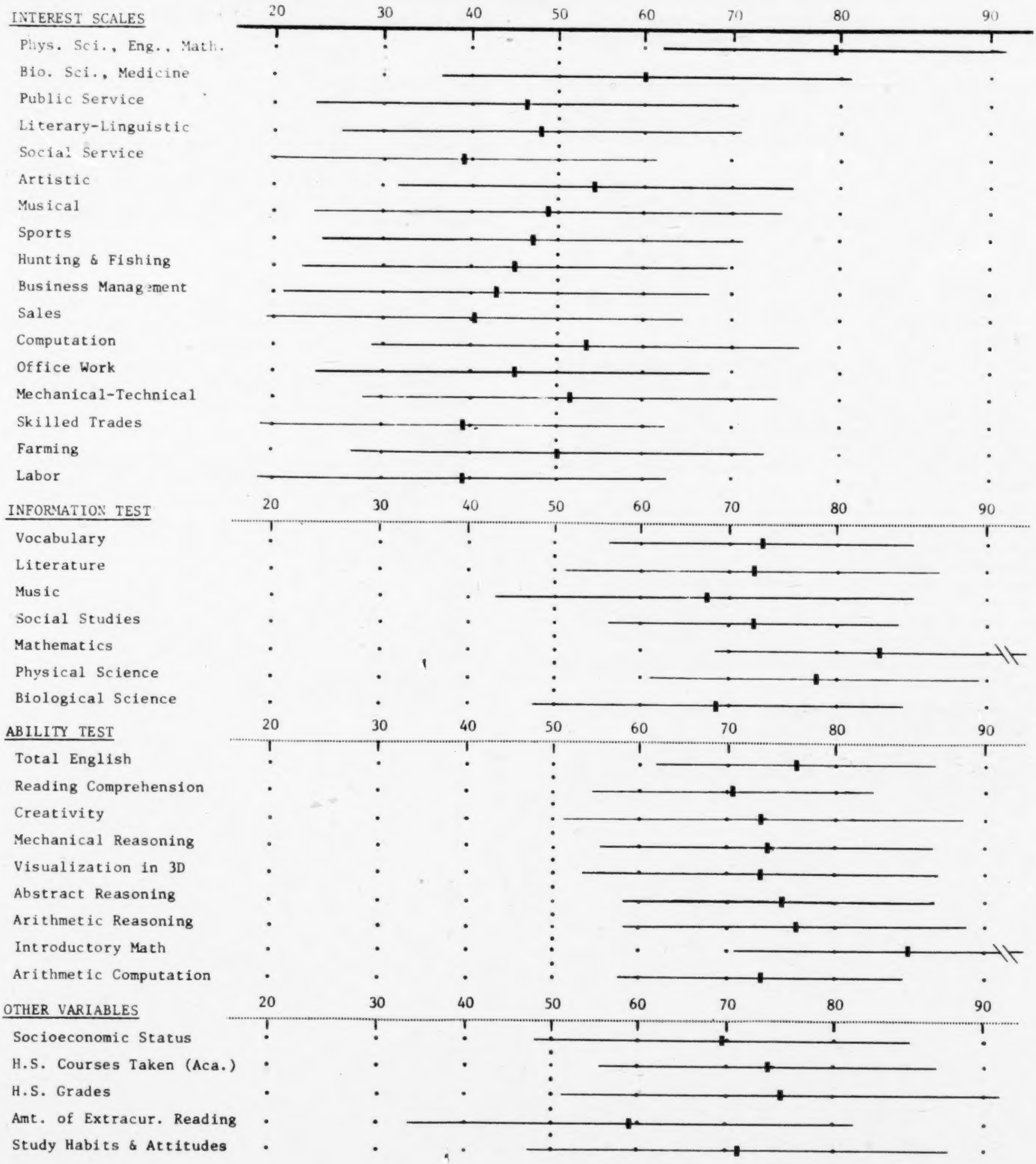
Others

General: High (75th percentile) in academic orientation of high school courses, and grades; low (59th percentile) in extracurricular reading.

Specific: 52nd percentile in sociability; 59th percentile in self-perception of reading skills.

ENGINEER - Civil, Hydraulic

(Male - n = 284)



ENGINEER - Electrical, Electronic

Importance: Largest section of engineering profession. (Electronic engineering a branch of electrical engineering.)

Electricity and electronics used in all manufacturing, transportation, communication. Electronic computers now an essential tool of business, government, and research. Electrical and electronic devices essential to national defense.

Training: See p. 30. Electrical engineers generally specialize in some particular branch of electrical engineering--electronics, power, communications, etc., or in particular areas within these fields. May be missile-tracking engineers, computer engineers, etc.

A few workers become electrical engineers without attending college by being promoted from assistant or technical status and by taking night classes or training programs.

Field of electrical and electronic engineering developing so rapidly that continuous study is necessary.

Work Activities: Most work in research and development; many in the design, testing, and quality control areas of production. May be field or sales engineers or liaison men maintaining contact between producer and consumer.

Electrical engineers design and help manufacture electrical and electronic equipment such as television sets, electric generators, radar, guided missiles, electrical appliances. May work in research, development, and design, in administration and management, in manufacturing, sales, or teaching. Many employed by telephone companies, public utilities, construction firms, government agencies, colleges and universities.

Outcomes: Improved and properly functioning electrical and electronics equipment.

Supervision; Social Relations: Dependent on place of employment and particular job.

Salary; Other Benefits: See p. 30. In 1969-70 the average starting salary for electrical engineers was about $10,400.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (84th percentile) in physical science, engineering and math; high (60th percentile) in biological science and medicine, computation, and mechanical-technical; lowest (39th percentile and below) in sports, hunting and fishing, business management, sales, skilled trades, farming, and labor.

Information

General: Average around 74th percentile on information scores; highest (85th percentile) in mathematics, and physical science; high (79th percentile) in vocabulary; low (71st percentile) in music.

Specific: Highest (88th percentile) in electricity and electronics; high (79th percentile) in aerospace; 68th percentile in engineering.

Abilities

General: Around the 77th percentile on ability scores; high (87th percentile) in introductory math; low (69th percentile) in arithmetic computation.

Specific: 72nd percentile in memory for words; 85th percentile in advanced math; 69th percentile in table reading.

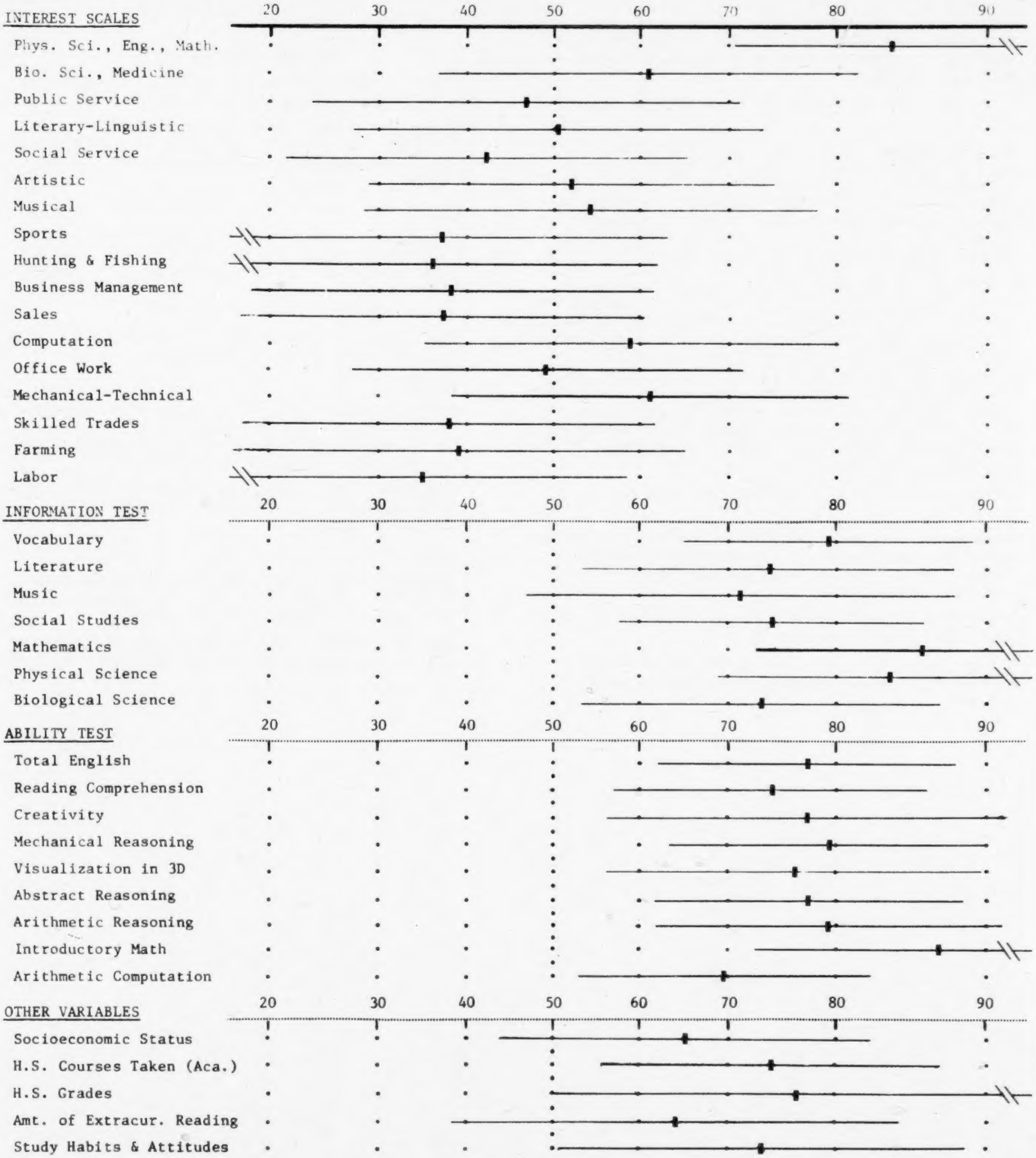
Others

General: High (76th percentile) in high school grades; low (65th percentile) in socioeconomic status, and extracurricular reading.

Specific: 46th percentile in sociability; 62nd percentile in self-perception of reading skills.

ENGINEER - Electrical, Electronic

(Male - n = 713)



ENGINEER - Mechanical, Automotive

Importance: Our economy is based on power, and mechanical engineers deal with the production and use of power. Automobile industry a major section of American economy.

Training: Similar to that for engineers in general--see p. 30.

Work Activities: Mechanical engineers devise and operate equipment and processes for the production of power, such as turbines, nuclear reactors, internal combustion engines; design and assist in the manufacture of machines that are run by power, including automobiles, ships, space vehicles, machine tools, refrigerating and air conditioning equipment.

Mechanical engineering so large a field that many specialties have developed, as automotive engineering, hydraulics engineering, air conditioning and refrigeration, instrument design, design of industrial machinery. Mechanical engineers work in research, development, and design, in maintenance, sales, and production, and as teachers or consultants. Nearly three-fourths of mechanical engineers work in manufacturing, mainly of metals, machinery, transportation and electrical equipment. Others in government agencies, education, engineering firms.

Automotive engineers do similar work in motor industry.

Outcomes: Efficient production of power and of power-using machines; design of new equipment connected with power. For automotive engineers, improved cars, engines, and automobile parts.

Supervision; Social Relations: Dependent on status, task, and place of employment.

Salary; Other Benefits: See p. 30. In 1969-70, mechanical engineers started at an average salary of $10,400.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (83rd percentile) in physical science, engineering and math; high (67th percentile) in mechanical-technical; low (37th percentile) in sales.

Information

General: Average around the 73rd percentile on information scores; highest (85th percentile) in mathematics; high (80th percentile) in vocabulary, and physical science; lowest (71st percentile) in literature, and biological science.

Specific: 77th percentile in aerospace, and mechanics; 69th percentile in engineering.

Abilities

General: Around the 78th percentile on ability scores; highest (85th percentile) in introductory math; lowest (73rd percentile) in reading comprehension, and arithmetic computation.

Specific: 71st percentile in memory for words; 84th percentile in advanced math; 71st percentile in table reading.

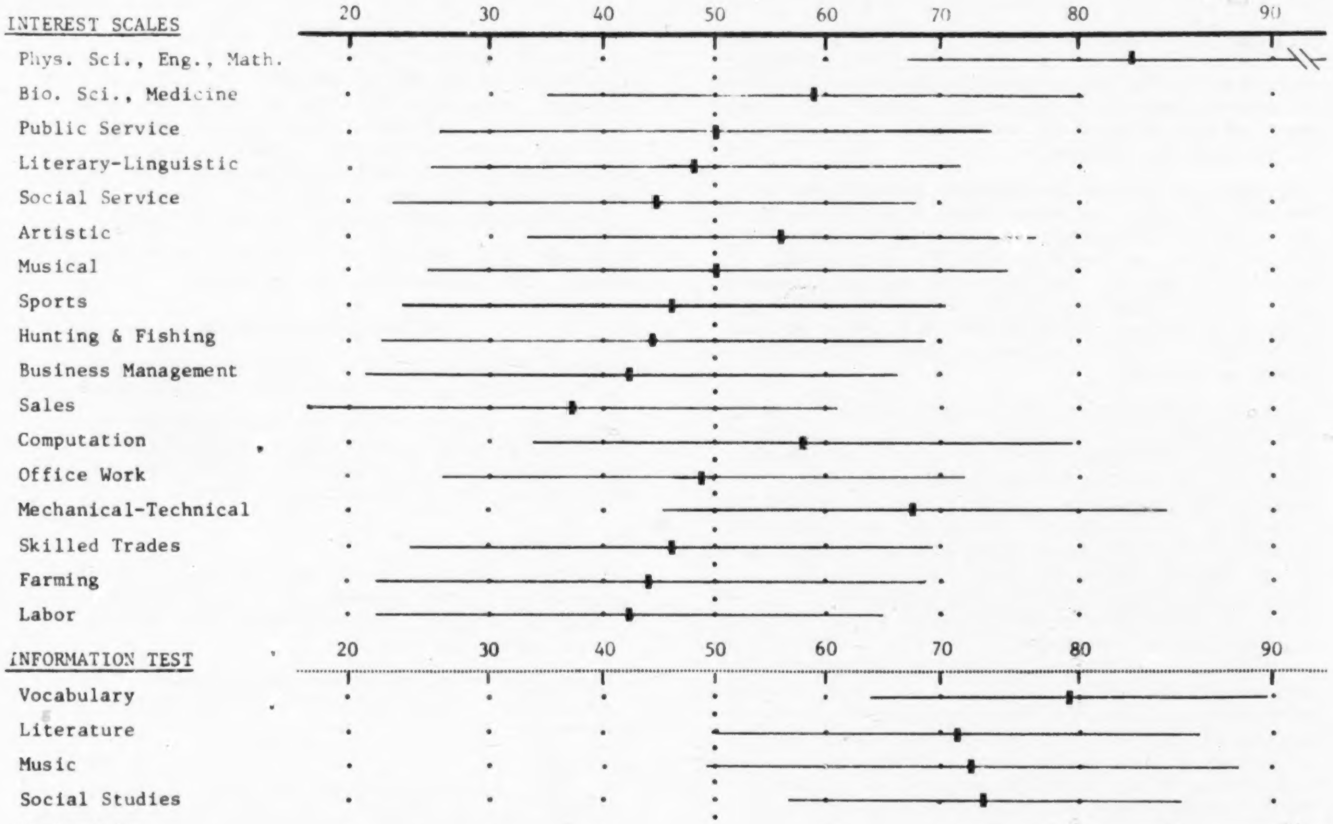
Others

General: High (74th percentile) in academic orientation of high school courses, and grades; low (61st percentile) in extracurricular reading.

Specific: 58th percentile in social sensitivity; and self-perception of reading skills.

ENGINEER - Mechanical Automotive

(Male - n = 418)



GEOLOGIST

Importance: Geology necessary for finding and efficiently using natural resources, for safe construction of building and engineering projects, for study of erosion, and for understanding the present structure and past history of the earth's crust and those of the moon and planets.

Training: Geologist should have advanced degree. Master's required to enter research and teaching; doctor's for advancement in teaching, research, administration. A few entry jobs for people with bachelor's degrees. For degree in geology, student also studies mathematics, physics, chemistry, sometimes engineering. Should study statistics and use of computer. Graduate students specialize in one branch of geology.

Work Activities: Geologist studies earth's crust and the rocks or soils that make it up. Searches for natural resources, studies supplies of ground water. Uses complex technological instruments, photography, computers. Studies fossils and ancient life-forms to date rocks. Geologist may specialize in earth materials, earth processes, or earth history. May be economic geologist (minerals and coal), petroleum geologist, engineering geologist (study of earth as foundation for buildings or roads, determining feasibility of tunnels, dams, etc.), mineralogist, geochemist, volcanologist (study of volcanoes), geomorphologist (study of land forms, erosion, glaciers), paleontologist (study of past life forms), stratigrapher (study of rock layers), astrogeologist (study of geology of moon and planets), geological oceanographer (study of sea beds and continental shelves). Nearly three-fifths of geologists work for private industry, as petroleum or mining companies. Others for federal and state governments, colleges and universities.

Outcomes: Knowledge about the earth's past and its history, location and efficient utilization of natural resources, information needed for engineering projects and erosion control, understanding of the nature of the planets.

Supervision; Social Relations: Usually begin on field projects or as research assistants in laboratories. Supervised by superior on project.

Salary; Other Benefits: In 1970 beginning geologists with bachelor's degree started working for federal government at $8,510 or $9,448; those with master's degree at $9,448 or $10,539; those with Ph.D. at $11,905 or $14,192. In private industry, those with bachelor's started at about $8,650, those with master's at $10,500, those with doctorates at $12,000. Median salary of earth scientists in 1970 about $14,900. Travel and strenuous field work sometimes necessary. In field work, working hours may be irregular.

Role of Sexes: Nearly 4% of American geologists women. Many laboratory jobs available.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (82nd percentile) in physical science, engineering and math; high (62nd percentile) in biological science and medicine; lowest (33rd percentile) in labor.

Information

General: Average around 78th percentile on information scores; highest (85th percentile) in physical science; lowest (73rd percentile) in vocabulary, and music.

Specific: 80th percentile in aerospace; 76th percentile in foreign travel, and outdoor activities.

Abilities

General: Around the 77th percentile on ability scores; highest (80th percentile) in introductory math; lowest (64th percentile) in arithmetic computation.

Specific: 72nd percentile in memory for words, and table reading; 85th percentile in advanced math.

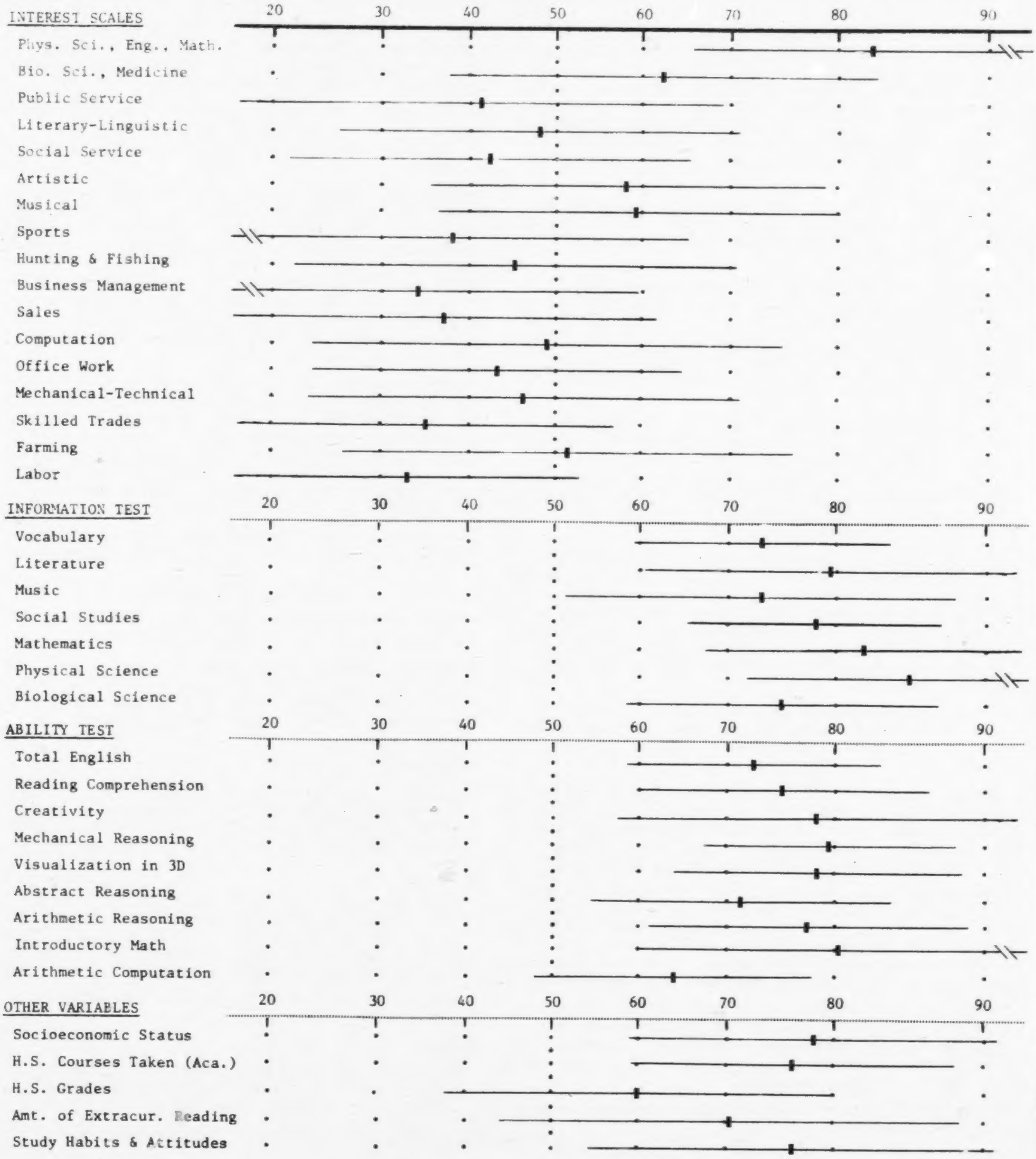
Others:

General: High (78th percentile) in socioeconomic status; low (60th percentile) in high school grades.

Specific: 62nd percentile in self-perception of reading skills.

GEOLOGIST

(Male - n = 58)



MATHEMATICIAN, STATISTICIAN

Importance: Mathematics is of particular importance in the conduct of scientific work; the mathematician collaborates with the scientist as part of a team of investigators. Besides the physical sciences, mathematics is employed increasingly in the biological and social sciences, and in planning industrial production. The use of computers has greatly increased the importance of mathematics and widened the opportunities for employment.

Statistics now widely used in business, research, and government to analyze changes, predict future trends, and provide information needed as basis for policy-making.

Training: For mathematician, bachelor's degree in mathematics, or in a related field with mathematics as a minor, is a minimum requirement. A large proportion of jobs require advanced degrees. For faculty positions in colleges and universities, or for top jobs in scientific research, a doctoral degree is required.

For statistician, minimum requirement is bachelor's degree with major in statistics or mathematics, or major in field in which statistician intends to work with a minor in statistics. For teaching and top jobs a higher degree in mathematics or statistics essential. May also need graduate training in special field in which he is using statistics.

Work Activities: For mathematician: in scientific research, inventing ways to represent variables studied in mathematical form. In statistics and quality control, designing and testing mathematical formulas to predict outcomes. In computer science, designing programs to perform complex mathematical operations. Usually the mathematician records what he does with pencil and paper.

In work with government departments, mathematicians deal with various social and economic statistics, as well as with such defense items as planes and spacecraft.

About a quarter of all mathematicians are in research and development, and nearly a third work in colleges or universities. Nearly a third are in management and administration. Others work in manufacturing, doing operations research, production and quality control.

For statistician: Description of situations in numerical terms. Collecting, analyzing by statistical means, and interpreting data. May analyze economic conditions, predict sales, develop quality-control tests, plan surveys, prepare mathematical models. Work for government, colleges and universities, research institutes.

Outcomes: For mathematician, mathematical expressions and formulas which represent and predict events in natural science, in society (population, income, etc.) and in the production of goods (automobiles, paper clips, and others of great variety).

For statistician, reliable answers to problems studied by statistical means.

Supervision; Social Relations: Mathematicians' work is primarily oriented toward numbers written on paper or on a blackboard. Often do this work alone, with only general supervision. Perhaps equally often, they are working as part of a small technical team including scientists or other specialists.

Statistician works under superior in office or department. Problem on which he is working often set for him by others. Like mathematician, often works as part of a team.

Salary; Other Benefits: In 1970 the median annual salary for mathematicians listed in a government register was $14,300. Starting salaries for mathematicians and mathematical statisticians with a bachelor's degree were $9,300-$9,600 in private industry and $7,856 or $9,718 in federal service. Those with master's degrees started at $11,500 to $12,200 in private industry or $9,718 or $11,526 in federal service. Ph.D.'s started at about $16,000 in private industry and at $13,096 or $14,192 in federal service.

In 1970 beginning statisticians hired by private industry paid about $7,000-$8,500 a year. With master's degree, $8,500-$10,000 a year. Federal government hired inexperienced statisticians with bachelor's degree at $6,548 or $8,098, with master's degree at $8,098 or $9,881, with Ph.D. at $11,905 or $14,192. Earned somewhat less in teaching than in industry, but opportunities for extra income.

Role of Sexes: In 1970 about one-tenth of mathematicians were women. Over 1/3 of statisticians women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (81st percentile) in physical science, engineering and math; high (69th percentile) in computation; lowest (29th percentile) in hunting and fishing, skilled trades, farming, and labor.

Information

General: Average around 79th percentile on information scores; highest (92nd percentile) in mathematics; high (86th percentile) in physical science; lowest (72nd percentile) in biological science.

Abilities

General: Around the 79th percentile on ability scores; highest (90th percentile) in introductory math; high (85th percentile) in English, and arithmetic reasoning; lowest (70th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 91st percentile in advanced math; 73rd percentile in table reading.

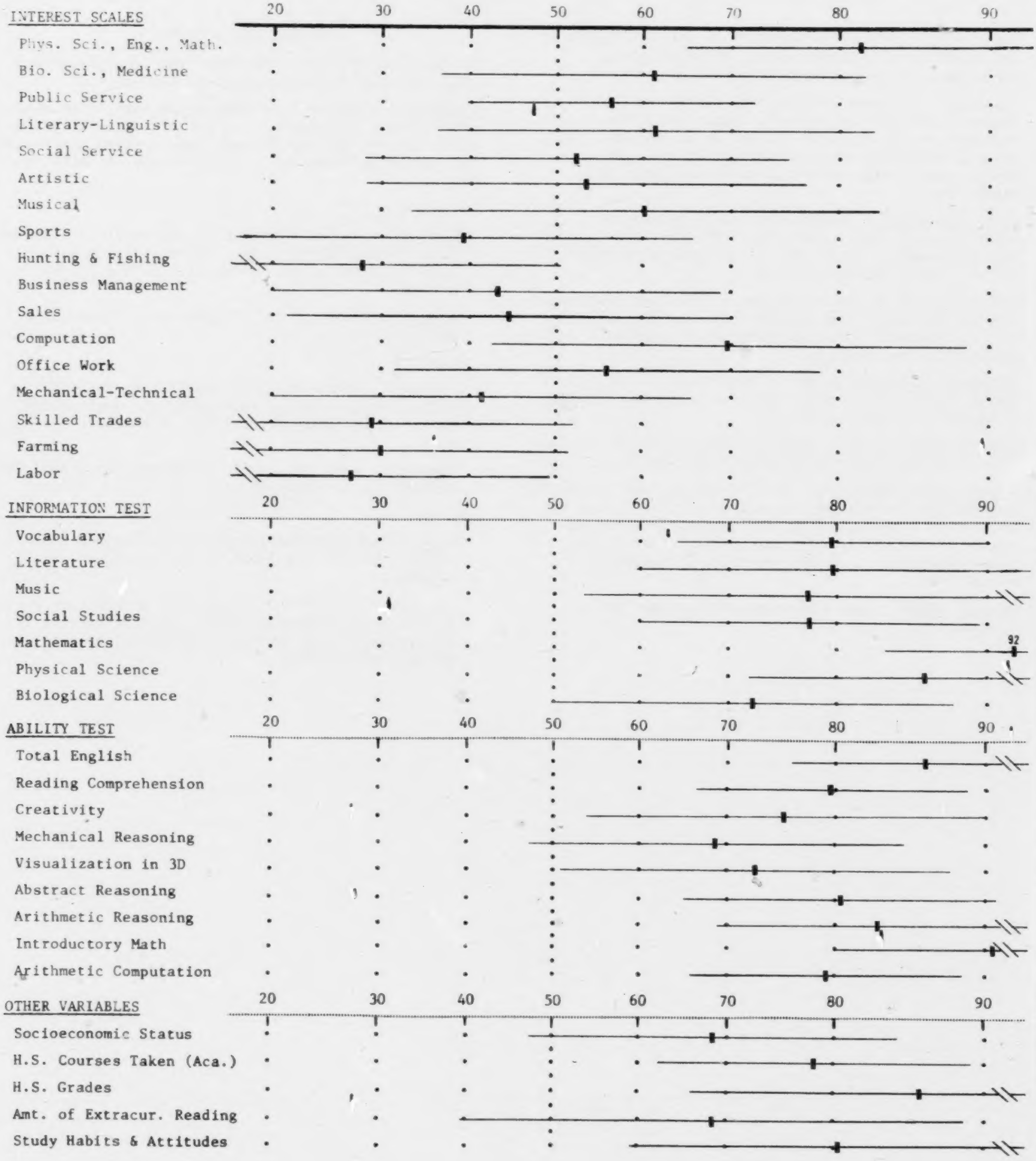
Others

General: High (86th percentile) in high school grades; low (68th percentile) in socioeconomic status, and extracurricular reading.

Specific: 60th percentile in self-perception of reading skills.

MATHEMATICIAN, STATISTICIAN

(Male - n = 140)



MATHEMATICIAN - College Mathematics Teacher

Importance: College mathematics an essential part of the training of mathematicians, statisticians, engineers, and scientists; essential in research.

Training: At least a bachelor's degree and in many places a master's or doctor's degree in mathematics required for teaching in college or university. Ph.D. usually necessary for full faculty status. Often starts career as graduate assistant while getting higher degree.

Work Activities: Teaches classes in mathematics; tests students and records results; supervises teaching assistants. Guides graduate students in research and writing of dissertations.

About a third of mathematicians are college teachers. College teacher of mathematics may also do part-time or in some cases full-time research in pure or theoretical mathematics.

Outcomes: Students properly instructed in the mathematics they will need for their careers; new findings in theoretical mathematics.

Supervision; Social Relations: Supervised by superior in mathematics department or by department head.

Salary; Other Benefits: In 1970 college and university instructors in mathematics earned a median salary of $8,700 for 9 months' work, and professors a median salary of $18,000 for the same period. Often earn additional money in summer or along with work in school year.

Role of Sexes: Some women are college teachers of mathematics.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (82nd percentile) in physical science, engineering and math; high (76th percentile) in literary-linguistic; lowest (26th percentile) in hunting and fishing, skilled trades, farming, and labor.

Information

General: Average around 87th percentile on information scores; highest (94th percentile) in mathematics; lowest (76th percentile) in biological science.

Specific: High (84th percentile) in electricity and electronics.

Abilities

General: Around the 81st percentile on ability scores; highest (95th percentile) in introductory math; lowest (70th percentile) in mechanical reasoning.

Specific: 79th percentile in memory for words; 95th percentile in advanced math.

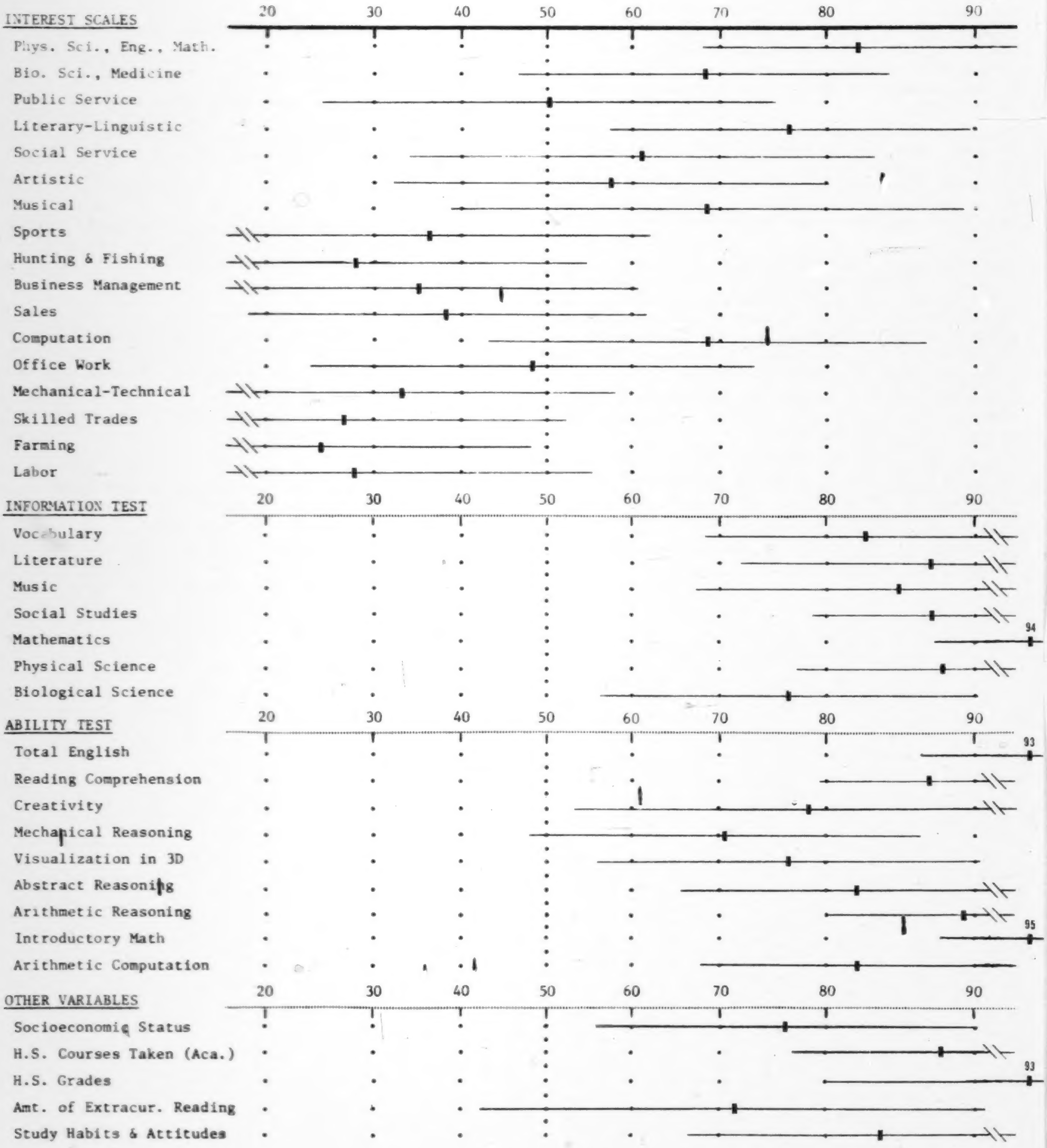
Others

General: High (93rd percentile) in high school grades; low (71st percentile) in extracurricular reading.

Specific: High (71st percentile) in self-perception of writing and reading skills; 33rd percentile in sociability; 57th percentile in social sensitivity, and self-confidence.

MATHEMATICIAN - College Mathematics Teacher

(Male - n = 81)



MATHEMATICIAN - High School Mathematics Teacher

Importance: Production of future mathematicians needed for scientific and industrial progress is dependent on training. Mathematical training needed by all students for use on their jobs and in their daily lives.

Training: As teacher must have state license in order to work. This usually requires a bachelor's degree, including several courses in education, and practice teaching. Some states, under an "Einstein law," waive these requirements for persons of exceptionally high qualification. See p. 126 on Training for High School Teachers.

Work Activities: Teaches mathematics to high-school students. In many school systems also assists with other duties such as extracurricular activities, study hall supervision, etc. In small schools may teach science as well as mathematics. May teach business arithmetic as part of commercial course, or shop mathematics as part of vocational course.

Outcomes: Students educated in mathematics needed for daily lives, for future jobs, and for further mathematical and scientific study.

Supervision; Social Relations: Supervised by head of department (in large school) and by assistant principal or principal. See p. 126.

Salary; Other Benefits: See p. 126.

Role of Sexes: High-school mathematics teachers may be either men or women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (86th percentile) in physical science, engineering and math; higher (79th percentile) in computation; high (73rd percentile) in mechanical-technical; lowest (38th percentile) in office work.

Information

General: Average around 80th percentile on information scores; highest (92nd percentile) in mathematics; low (74th percentile) in biological science, and music.

Abilities

General: Around the 83rd percentile on ability scores; high (94th percentile) in introductory math; low (78th percentile) in reading comprehension, and creativity.

Specific: 76th percentile in memory for words; 90th percentile in advanced math.

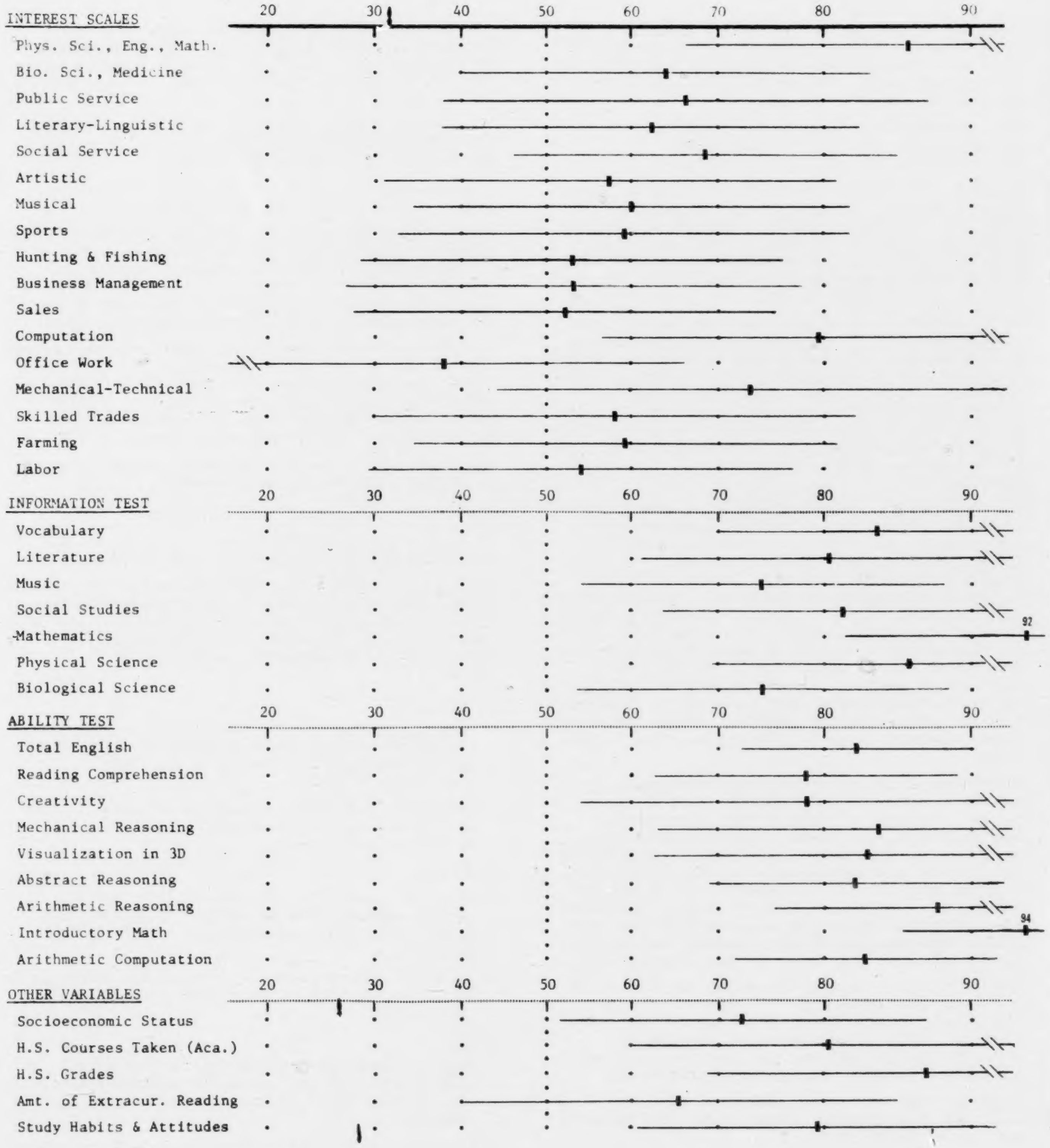
Others

General: High (87th percentile) in high school grades; low (68th percentile) in socioeconomic status, and extracurricular reading.

Specific: 45th percentile in sociability; 55th percentile in social sensitivity, and self-confidence; 58th percentile in self-perception of reading skills.

MATHEMATICIAN - High School Mathematics Teacher

(Female - n = 421)



PHYSICAL SCIENTIST (not elsewhere classified)

Importance: Term physical scientist includes such occupations as chemist, physicist, astronomer, geologist, and meteorologist, who deal with basic laws of the physical world. Our modern living standards are based on the use of these laws.

(For information on Chemist, see p. 28.
For information on Physicist, see p. 52.
For information on Geologist, see p. 42.)

Training: Astronomer should have Ph.D. or at least master's degree. Bachelor's degree enough for some entry jobs but lessens chance of promotion. Physics and mathematics most important; should also study chemistry, statistics, electronics. Some take bachelor's degree in physics or mathematics then transfer to astronomy for graduate work.

Meteorologist must have bachelor's degree with major in meteorology or in a related subject with courses in meteorology. Should have physics and mathematics also. For research, teaching, and advancement should have higher degree, preferably in meteorology. Meteorological training given by armed forces, both on the job and in college and university courses to which military personnel are sent. Federal government also has on-the-job training programs for civilian meteorologists.

Work Activities: Astronomer studies structure and origin of the universe. Tries to determine facts about planets and other heavenly bodies; studies cosmic radiation, size and shape of earth. Uses complex photographic techniques, technical devices. To process data often uses computers. May specialize in astrophysics (study of stars), dynamical astronomy (motions of heavenly bodies), radio astronomy, spectroscopy (study of light from heavenly bodies). Over two-thirds of astronomers in research; nearly one-fifth in teaching. Others in administration, instrument design, etc. Nearly 3/4 of all astronomers work for colleges and universities, others for observatories otherwise financed, government, and aerospace firms.

Meteorologist studies movement and behavior of atmospheres of earth and other members of solar system. May put knowledge to practical use in predicting weather, storms, and floods. Usually specializes; may be weather forecaster, climatologist (who studies past records to determine an area's normal climate), physical meteorologist (who studies composition and properties of atmosphere), meteorological instrumentation specialist, industrial meteorologist (who makes weather forecasts for private customers and studies air pollution control, tries to make rain and snow).

About a third of civilian meteorologists work in research and development, about a third in weather forecasting, about a fourth in management and administration. Many in combination of teaching and research. Nearly half work for government, others for private industry, colleges and universities.

Outcomes: For astronomer, additional knowledge about earth and other heavenly bodies, space, and the nature and past of the universe.

For meteorologist, additional knowledge about the composition and behavior of atmospheres and application of this knowledge to fill the needs of industry, agriculture, aviation, pollution control, and disaster prevention.

Supervision; Social Relations: Astronomers with bachelor's or master's degrees often work as assistants while studying for doctorate.

Meteorologists in small weather stations usually work alone. In larger ones they work as part of a team.

Salary; Other Benefits: In 1970, astronomers entering government service with bachelor's degree started at $8,292 or $10,258; with some graduate training at $10,258 or $11,526; with Ph.D. at $13,096 or $14,192. Median 1970 salary of astronomers with bachelor's or master's degree about $13,100, with Ph.D. $15,100.

In 1970 beginning meteorologists with bachelor's degree entering federal service started at $8,292 or $10,258; those with master's degrees at $10,258 or $11,526, and those with Ph.D.'s at $13,096 or $14,192. Airline meteorologists started at $9,700 to $12,300 a year. Median salary of registered meteorologists $15,200.

Role of Sexes: A few astronomers are women. About 2% of civilian meteorologists are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (78th percentile) in physical science, engineering and math; high (62nd percentile) in biological science and medicine, artistic, and computation; lowest (34th percentile) in hunting and fishing, business management, sales, and skilled trades.

Information

General: Average around 83rd percentile on information scores; highest (89th percentile) in mathematics, and physical science; lowest (73rd percentile) in music.

Specific: High (84th percentile) in aerospace, and electricity and electronics; 68th percentile in mechanics, and military.

Abilities

General: Around the 78th percentile on ability scores; highest (85th percentile) in introductory math; lowest (67th percentile) in arithmetic computation.

Specific: 76th percentile in memory for words; 83rd percentile in advanced math; 68th percentile in table reading.

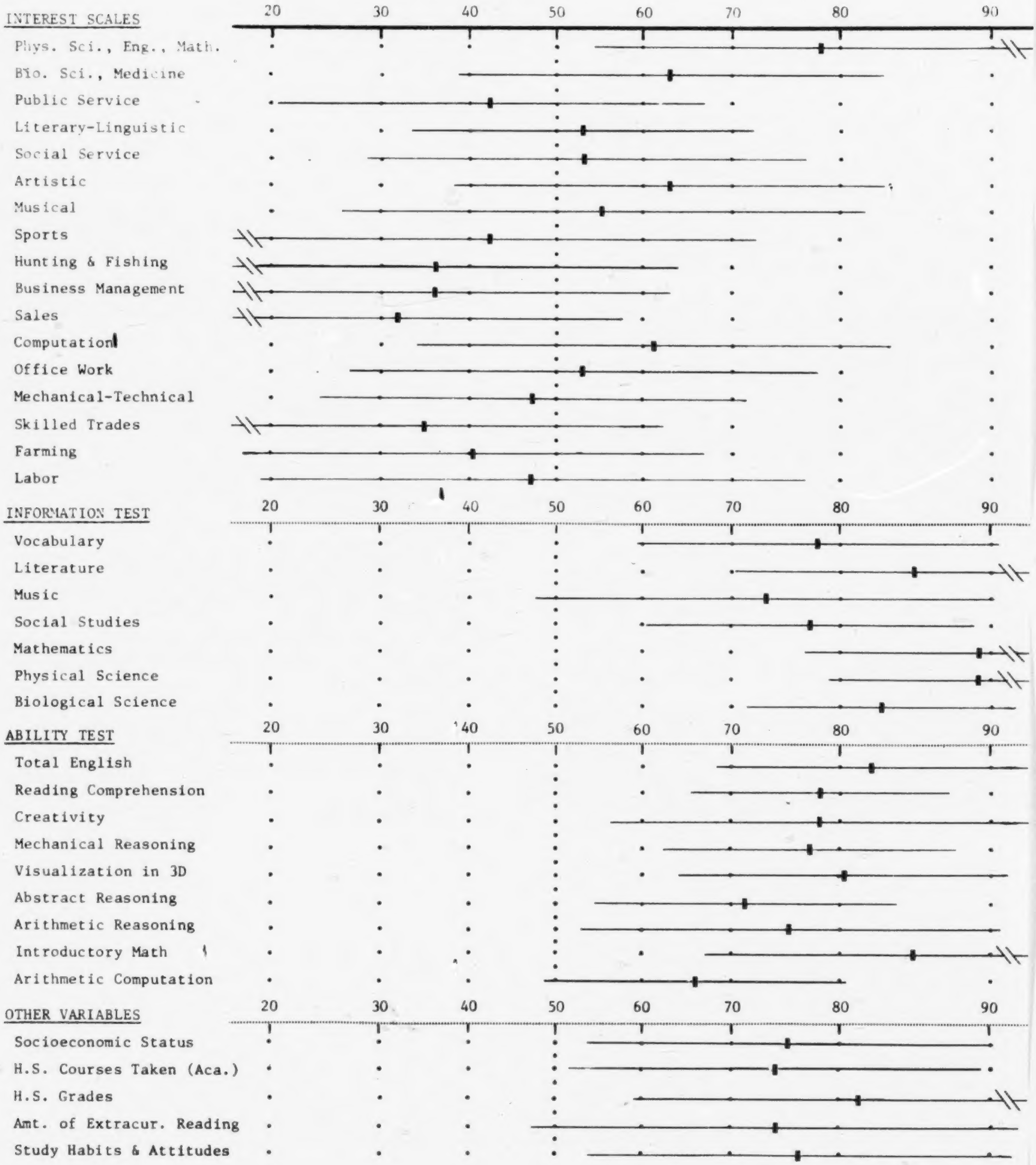
Others

General: High (81st percentile) in high school grades; low (74th percentile) in academic orientation of high school courses, and extracurricular reading.

Specific: High (71st percentile) in self-perception of reading skills.

PHYSICAL SCIENTIST (not elsewhere classified)

(Male - n = 49)



PHYSICIST

Importance: Physics provides information needed in transportation, communication, construction, manufacturing, defense. Essential in space flight, oceanography, work against air pollution, power development.

Training: Physicist needs as minimum bachelor's degree with major in physics. Many positions require graduate degrees. Doctor's degree needed for high-level teaching positions and leadership of research and development projects. Many physicists with bachelor's degrees work as graduate assistants in teaching and research while working for higher degrees, or in applied research and development. After taking bachelor's degree physicist usually specializes in a particular field.

Work Activities: Physicists work with matter, energy, and the relationship between them. Work on nuclear energy, electronics, communications, space problems. Generally specialize in some particular branch or subdivision of physics, as optics, atomic physics, crystal physics, lasers. May work in area between physics and some other field, as biophysics, astrophysics. Physics enters into many other fields, as in archaeologists' use of Carbon-14 method of dating.

Almost three-fifths of physicists work in research and development; some in basic and some in applied research. About one-fifth teach in colleges and universities; about one-fifth are in management and administration, chiefly of research and development projects. Work for private industry, colleges and universities, federal government, especially Department of Defense, state governments.

Outcomes: New scientific facts and theories, new methods of applying them; successful application of existing facts and theories.

Supervision; Social Relations: Beginning physicists usually supervised by professional superior; later much self-direction possible in regard to methods.

Salary; Other Benefits: In 1970 physicists with bachelor's degree began at about $9,900 in private industry, and at $8,292 or $10,258 for federal government. With master's degrees started at about $11,800 in private industry; at $10,258 or $11,526 for federal government. Ph.D.'s salaries depended on specialty and experience; began at about $15,000 in private industry and $13,096 or $14,192 for federal government. Median salary for physicists was about $15,900.

Role of Sexes: Almost 4% of physicists women in 1970.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (90th percentile) in physical science, engineering and math; high (68th percentile) in biological science and medicine; lowest (33rd percentile and below) in sales, skilled trades, farming, and labor.

Information

General: Average around 81st percentile on information scores; highest (91st percentile) in mathematics, and physical science; lowest (77th percentile) in music.

Specific: High (88th percentile) in aerospace, and electricity and electronics; 76th percentile in mechanics, and military.

Abilities

General: Around the 86th percentile on ability scores; highest (92nd percentile) in introductory math; lowest (77th percentile) in arithmetic computation.

Specific: 78th percentile in memory for words; 93rd percentile in advanced math; 64th percentile in table reading.

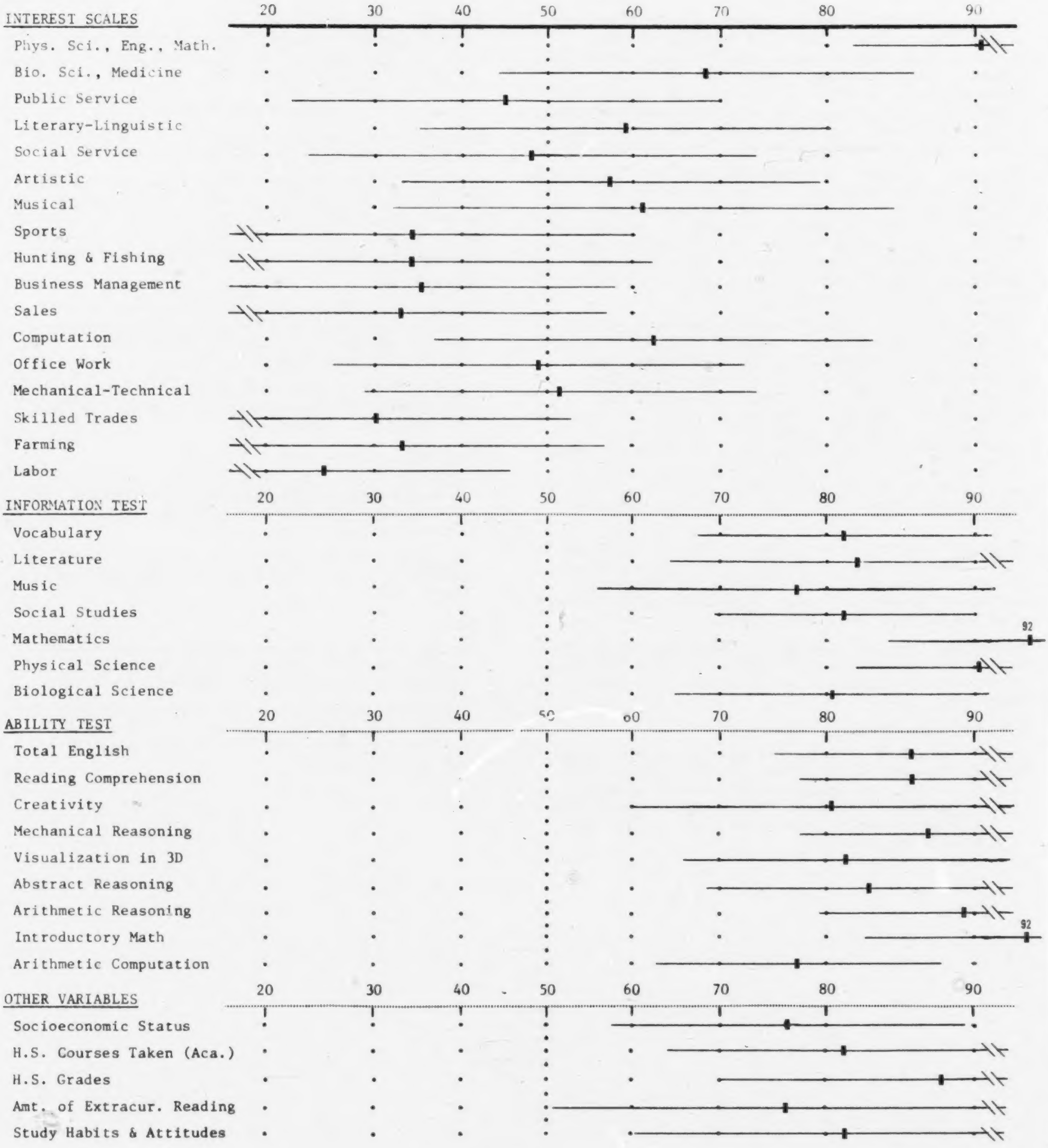
Others

General: High (88th percentile) in high school grades; low (76th percentile) in socioeconomic status, and extracurricular reading.

Specific: 74th percentile in self-perception of reading skills.

PHYSICIST

(Male - n = 169)



SCIENCE TEACHER - College

Importance: College and university science teachers responsible for producing the scientists on whom national prosperity, progress, and security partially depend. During college or university years the science-oriented student is developed into a working scientist. Also responsible for giving some knowledge of science, needed for understanding our contemporary civilization, to students who will work in other areas.

Training: Graduate instructor may have only bachelor's degree, but for full-time college or university teaching master's degree usually required. Ph.D. desirable; for some jobs may be necessary. To teach in a state junior college one may need a teaching certificate which requires education courses and practice teaching. Specialization in some particular branch of science is expected of college teachers.

Work Activities: College teachers instruct college students in the sciences. Usually a college teacher teaches only one specific branch of science, such as chemistry or physics. He prepares and delivers lectures, gives and grades tests, or supervises their grading, supervises laboratory work, and monitors the progress of graduate students. At the higher ranks he often has assistants to help him in his work. College science teachers often do research as well. May act as consultant to business, research, or government organizations. May write textbooks, books, or articles.

Outcomes: Science majors prepared for future scientific education and for careers in science; students in other fields given some knowledge of scientific method and scientific facts. Also products of research that may be done along with teaching.

Supervision; Social Relations: Supervised by immediate superior or by head of department. Personal influence on students choosing his own field as a life work important.

Salary; Other Benefits: See p. 152.

In 1970, starting salaries for physics teachers with Ph.D.'s averaged $1,000 month. In chemistry, median starting salary for teachers with bachelor's degree no experience was about $6,600; for teachers with r's degree and no experience about $8,000, and h.D.'s $11,200.

Role of Sexes: Some women are college and university science teachers, but in engineering, the physical sciences, agriculture, and law, nine-tenths of college and university teachers are men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (82nd percentile) in physical science, engineering and math, and biological science; high (68th percentile) in literary-linguistic, social service, and musical; lowest (33rd percentile) in business management, skilled trades, and labor.

Information

General: Average around 84th percentile on information scores; highest (90th percentile) in mathematics, and physical science; lowest (82nd percentile) in biological science.

Specific: High (83rd percentile) in aerospace, and electricity and electronics; 69th percentile in mechanics, and engineering.

Abilities

General: Around the 81st percentile on ability scores; highest (87th percentile) in English, and introductory math; lowest (67th percentile) in arithmetic computation.

Specific: 78th percentile in memory for words; 90th percentile in advanced math; 69th percentile in table reading.

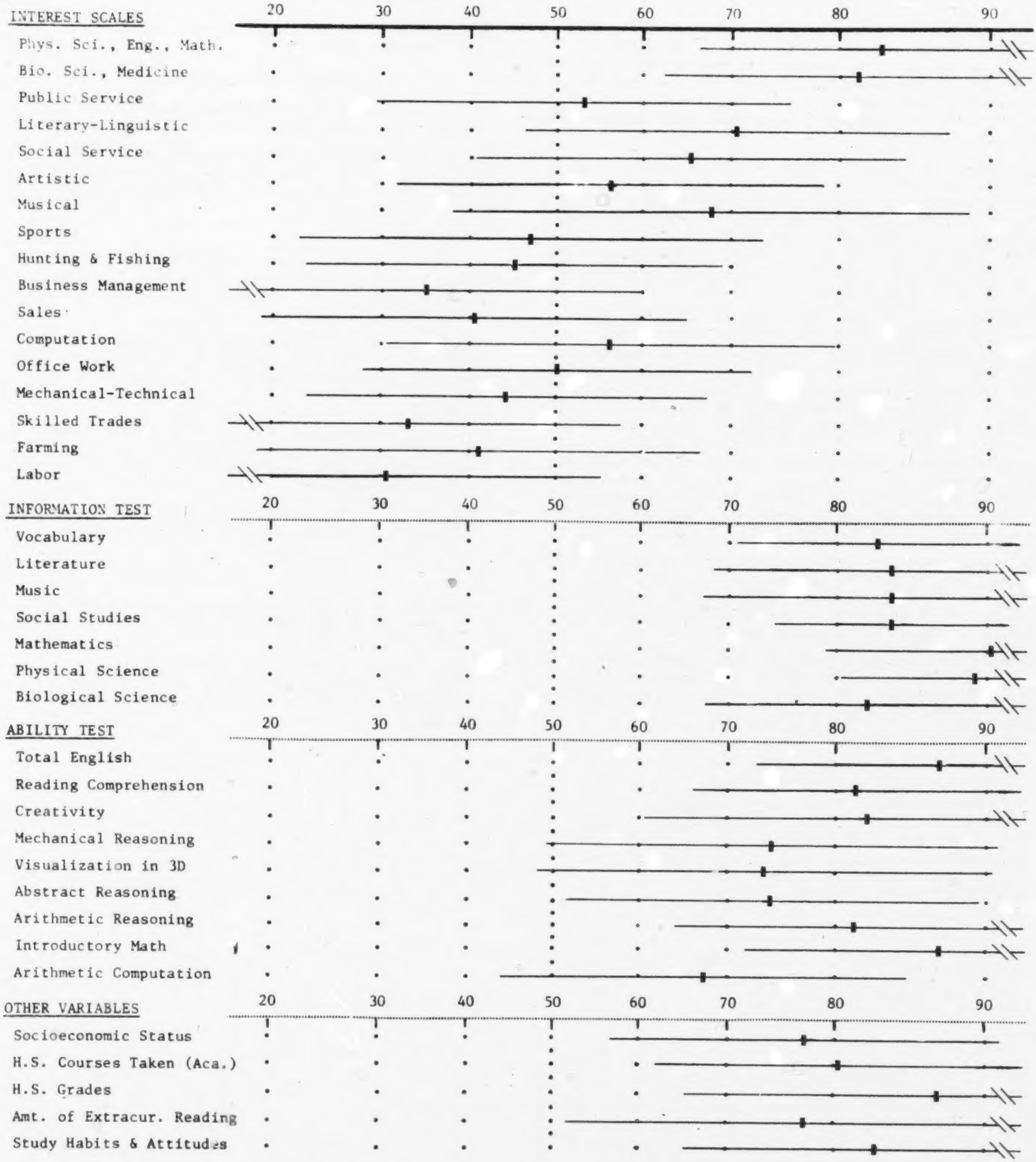
Others

General: High (87th percentile) in high school grades; low (77th percentile) in socioeconomic status, and extracurricular reading.

Specific: High (74th percentile) in self-perception of writing and reading skills; 51st percentile in sociability; 64th percentile in social sensitiv and self-confidence.

SCIENCE TEACHER - College

(Male - n = 178)



SCIENCE TEACHER - High School

Importance: Knowledge of science now necessary for every citizen because of importance of scientific problems as electoral issues. Science needed as basis for many of the vocations students will follow. Sound scientific basis needed by students who will later study scientific subjects in college or technical school.

Training: See p. 126. A few states permit persons of proven competence in science to teach without undergoing education courses or practice teaching. A science teacher has to be more capable and better prepared in his field than teachers of most subjects, since laboratory work is intolerant of mistakes and since bright students find it easy, in so objective a field, to challenge the instructor.

Work Activities: High school science teachers spend most of their time teaching science, but in many school systems may assist in such tasks as supervision of study halls and social affairs. In small schools the science teacher may also be the teacher of mathematics. In larger schools the science teacher may be able to specialize in the teaching of one particular science, such as chemistry or biology. A science teacher usually is responsible for extracurricular activities, such as clubs, in the field of science as well as for his regular teaching duties. He assists students with individual science projects and sometimes puts on such functions as a "science fair."

Outcomes: Students with the scientific knowledge required as citizens, in the various vocations which they may enter after leaving high school, and for further study of the sciences and science-related subjects in college or technical school.

Supervision; Social Relations: Supervised by assistant principal or principal and (in large school) by head of department. Personal influence on students going into science important.

Salary; Other Benefits: See p. 126.

Role of Sexes: High-school science teachers may be either men or women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (71st percentile) in physical science, engineering and math, and biological science and medicine; lowest (37th percentile) in skilled trades and labor.

Information

General: Average around 76th percentile on information scores; highest (78th percentile) in mathematics, and physical science; lowest (67th percentile) in music.

Specific: High (76th percentile) in electricity and electronics; 72nd percentile in aerospace, and engineering; 60th percentile in mechanics.

Abilities

General: Around the 71st percentile on ability scores; highest (76th percentile) in English, and introductory math; lowest (55th percentile) in arithmetic computation.

Specific: 73rd percentile in memory for words; 78th percentile in advanced math; 57th percentile in table reading.

Others

General: High (74th percentile) in study habits and attitudes; low (61st percentile) in extracurricular reading.

Specific: 54th percentile in sociability; 57th percentile in social sensitivity, and self-confidence; 61st percentile in self-perception of reading skills.

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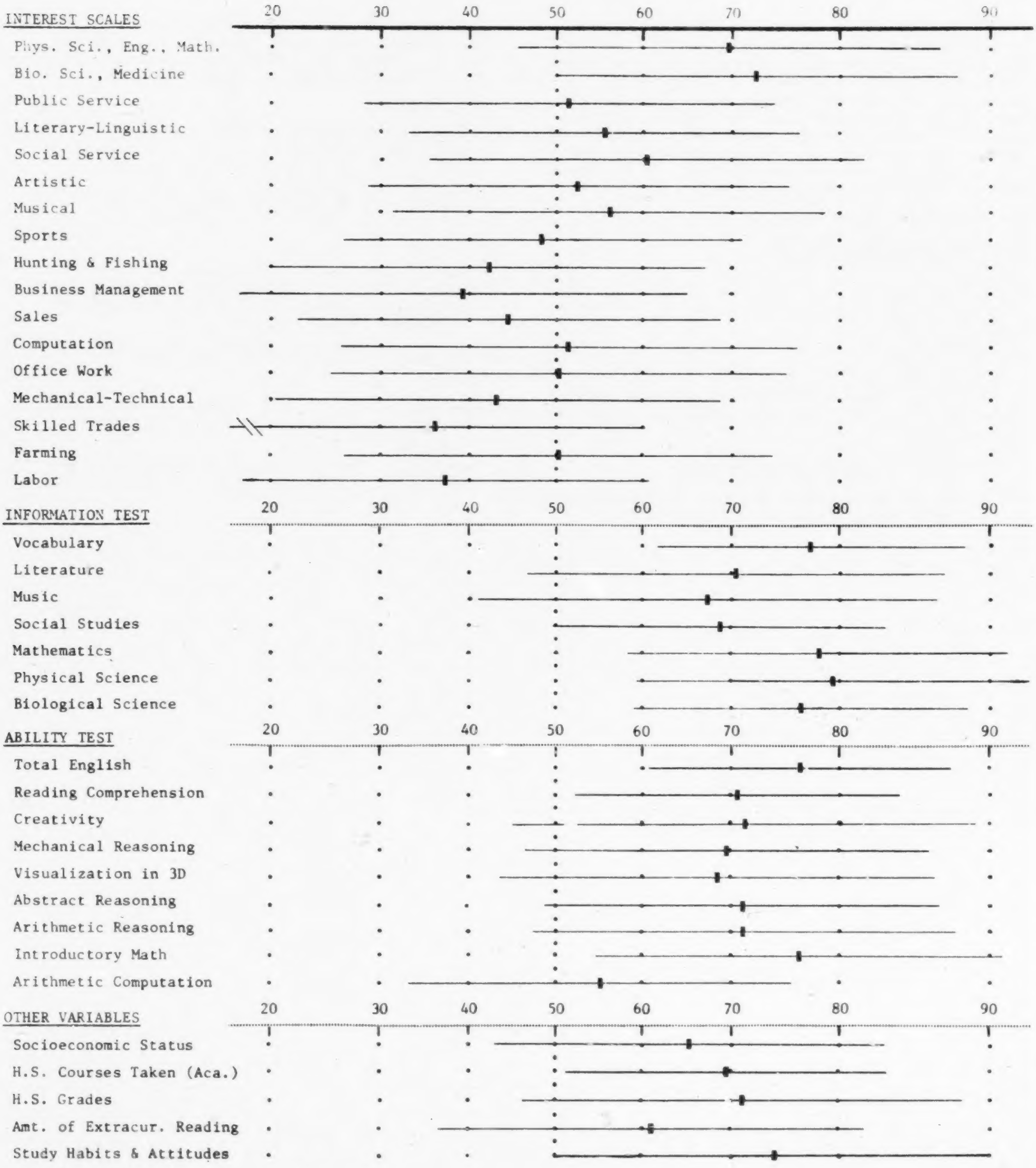
SCIENCE TEACHER - High School

(Male - n = 166)



CHAPTER 4

CAREER GROUP 2

Medical and Biological Sciences

The occupations in this group involve working with living organisms (microbes, plants, animals, and men) and their life processes. Workers in the area of medicine provide services related to human health. In the biological sciences, workers explore problems related to all aspects of life. The work of these biological scientists benefits workers in such fields as agriculture, forestry, and wildlife management, as well as those in medicine and pharmacy, and is important to food production and to health.

The occupations listed in Career Group 2 are:

- Agricultural Specialist (A)
- Biologist, Zoologist (B)
- Dentist (C)
- Nurse (Females) (d)
- Pharmacist (E)
- Physician (F)
- Veterinarian (G)
- Wildlife, Conservation Specialist (H)

Occupations in this Career Group all require at least four years of college with many courses in science and mathematics.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (75th percentile) in biological science; high (65th percentile) in physical science; lowest (33rd percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around 72nd percentile on information scores; highest (77th percentile) in mathematics; lowest (67th percentile) in music.

Specific: High (70th percentile) in health; 65th percentile in scientific attitude.

Abilities

General: Around the 70th percentile on ability scores; highest (75th percentile) in English, and introductory math; lowest (62nd percentile) in three-dimensional visualization.

Specific: 70th percentile in memory for words.

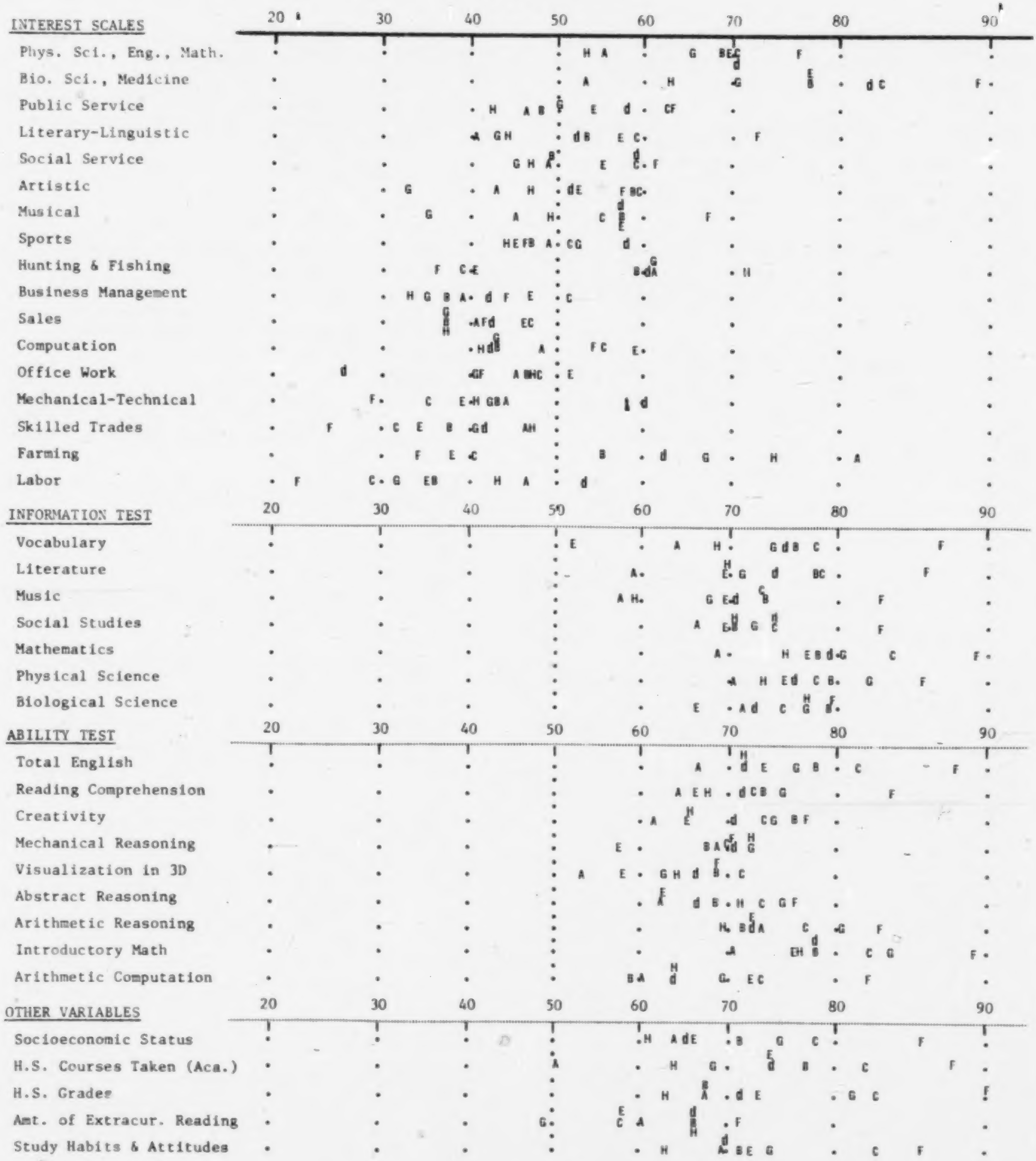
Others

General: High (72nd percentile) in socioeconomic status; low (60th percentile) in extracurricular reading.

Specific: 50th percentile in sociability; 60th percentile in self-perception of reading skills.

CAREER GROUP 2

Medical and Biological Sciences



AGRICULTURAL SPECIALIST

Importance: Agricultural specialists needed to determine best uses for land, encourage conservation, and help farmer in practical application of scientific findings.

Training: For cooperative extension service worker, B.S. degree, preferably with some training in education. Training given after hiring; in-service training programs through career. For soil scientist, B.S. degree with major in soil science or related field, with 30 semester hours of course work in biological, physical and earth science, including 15 hours in soils. Advanced degrees advisable for promotion. For soil conservationist, B.S. degree with major in soil conservation or related fields, with 30 semester hours in natural science or agriculture, including at least 3 hours in soils.

Typical Work Activities: Extension service worker on county level (county agricultural agent) helps farmers apply scientific agricultural methods. Puts new findings into practical use. Advises and encourages rural residents on all aspects of farming; works with rural youth groups, tries to improve quality of rural life. Extension worker on state level prepares materials and programs for workers on county level.

Soil scientist studies and classifies soils, determines best uses and management techniques. Prepares maps showing kinds of soil.

Soil conservationist helps farmers with problems of soil and water conservation. Advises on erosion prevention, soil improvement, improvement of pasture, forest, and range areas, irrigation methods. Provides technical guidance to farmer in his conservation program.

Extension workers, soil scientists, soil conservationists typically employed by government.

Outcomes: Better use of land, more productive farming practices, improvement in rural life.

Supervision; Social Relations: Supervised by superiors in organization. For those at local level, good relations with public essential.

Salary; Other Benefits: Extension workers' salaries vary according to location and status.

In 1971 beginning soil scientists and soil conservationists entered federal service at $6,938. With several years' experience and good qualifications earned $12,615 to $20,815.

Role of Sexes: Few women work as agricultural specialists.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (81st percentile) in farming; high (61st percentile) in hunting and fishing; lowest (40th percentile) in literary-linguistic, business management, and sales.

Information

General: Average around 66th percentile on information scores; highest (71st percentile) in physical science, and biological science; lowest (57th percentile) in music.

Specific: Highest (84th percentile) in farming; 67th percentile in outdoor activities.

Abilities

General: Around the 64th percentile on ability scores; highest (72nd percentile) in arithmetic reasoning, and introductory math; lowest (53rd percentile) in three-dimensional visualization.

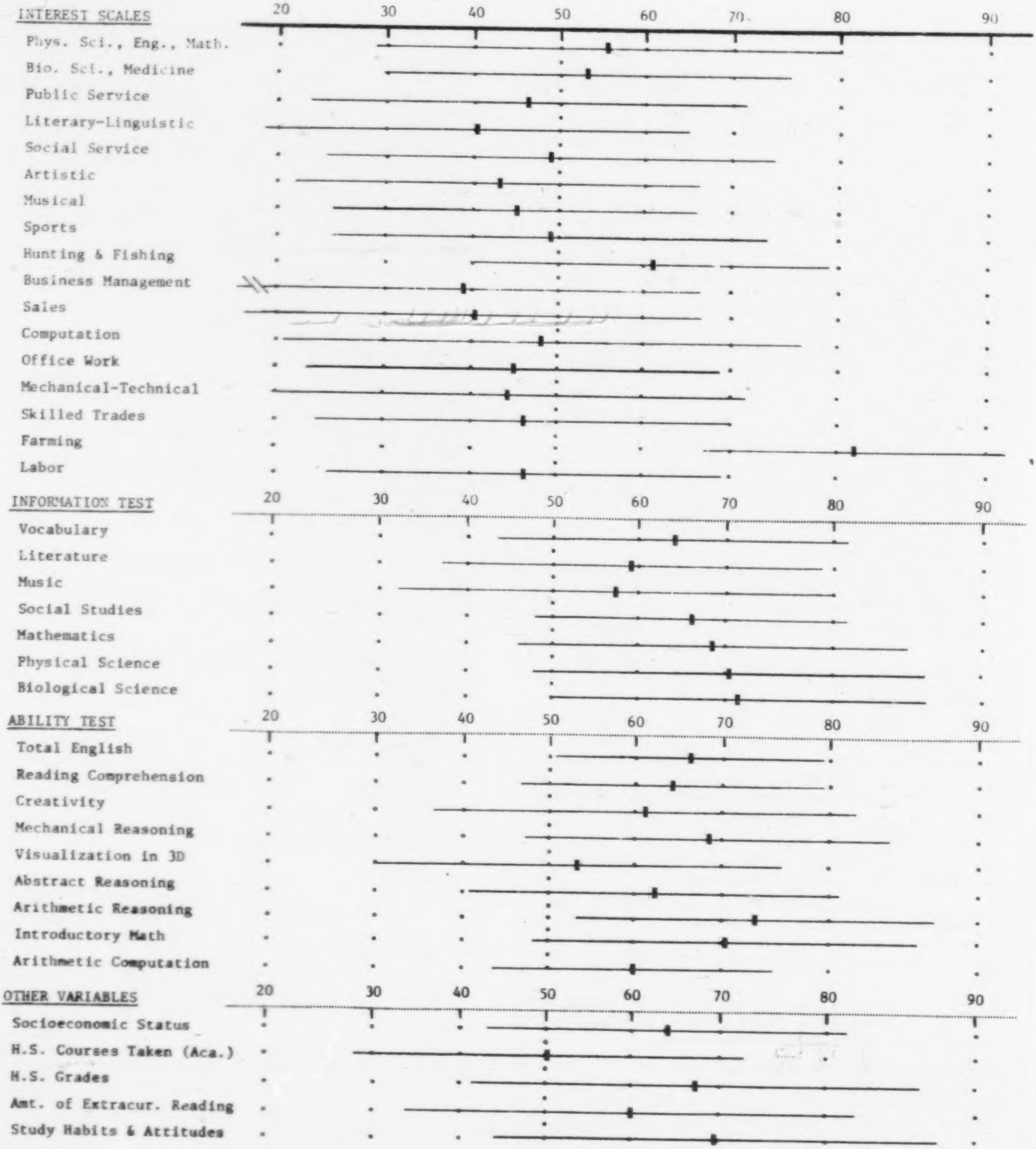
Others

General: High (69th percentile) in study habits and attitudes; low (50th percentile) in academic orientation of high school courses.

Specific: 48th percentile in sociability; 53rd percentile in self-confidence; 60th percentile in self-perception of reading skills.

AGRICULTURAL SPECIALIST

(Male - n = 96)



BIOLOGIST, ZOOLOGIST

Importance: Biologists, who are included in the larger group known as life scientists, study living organisms and the processes of life--its structure, functioning, and behavior. Many of biology's findings contribute to human well-being, directly or indirectly, through their applications to other fields. Zoology one of the life sciences. Findings relevant to agriculture and often to human medicine.

Training: To work in the life sciences student should plan to get a master's and if possible a Ph.D. degree. However, can get a beginning job with a bachelor's degree and a major in one of the life sciences. These jobs usually involve testing, enforcement of regulations, technological, or routine work. With bachelor's degree can become a high-school teacher. Master's degree sufficient for applied research and some college teaching jobs. For high-level teaching, for independent research, and often for administration of research programs, doctorate is necessary.

Life scientist needs training not only in biology but in other fields such as chemistry, physics, statistics, mathematics, and use of the computer. Mastery of laboratory and fieldwork techniques important.

Typical Work Activities: Biology broken up into many specialties. Major divisions are those that deal with plants--botany; with animals--zoology; and with microorganisms--microbiology. Each of these includes many smaller subdivisions.

Botanist identifies and classifies plants, studies their relationship with environment, their structure, life processes, and diseases. Agronomist is botanist particularly interested in food crops. Looks for and tries to develop hardier and more productive varieties, and seeks means to control pests and weeds. May study medicinal herbs and try to find new medical substances in them.

Zoologist studies animals, their structure, classification, behavior, and life processes. May work in laboratory or in field. Many specialize in one particular kind of animal, as mammalogists in the study of mammals. Paleozoologists study animals of ancient times. In drug industry, zoologist studies effect of drugs on animals.

Microbiologist studies microscopic organisms such as bacteria, viruses, molds; and serums.

Geneticist studies hereditary characteristics. May be engaged in either applied or theoretical genetics. Primary work of applied genetics is with plants and animals, to develop strains that will be more useful to man.

Biological oceanographer often called marine biologist. Studies sea's organisms, both plant and animal, and the way in which their changing environment affects them.

Anatomist studies the shape and structure of organisms. Biochemist studies their chemical processes. Biophysicist studies their ways of responding to physical forces. Ecologist studies organisms' relation to each other and to the environment. Entomologist studies insects and the ways of controlling those that are harmful.

Pathologist studies disease in plants, animals, and humans. Pharmacologist studies the effect of drugs and other substances on living things. Physiologist studies cells, tissues, and organs and the ways in which their working is affected by environment.

Many life scientists (a category which includes biologists) work as teachers and researchers in schools and colleges; others for medical schools, federal and state governments, and private industry.

Outcomes: New biological and zoological facts and the innovative or successful application of known facts.

Supervision; Social Relations: Dependent on nature of job. Usually considerable supervision at beginning of career; much less if successful.

Salary; Other Benefits: In 1970, life scientists with bachelor's degree going to work for federal government started at $6,548 or $8,098 a year. With master's degree started at $8,098 or $9,881, with Ph.D. at $11,905 or $14,192. Median salary for biological scientists $15,000. Pay usually higher in private industry.

Role of Sexes: In 1970 about 10% of life scientists women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (77th percentile) in biological science and medicine; high (68th percentile) in physical science; lowest (37th percentile) in business management, sales, skilled trades, and labor.

Information

General: Average around 78th percentile on information scores; highest (79th percentile) in physical and biological sciences; lowest (70th percentile) in social studies.

Specific: High (76th percentile) in health; 74th percentile in aerospace.

Abilities

General: Around the 71st percentile on ability scores; highest (78th percentile) in English, and introductory math; lowest (59th percentile) in arithmetic computation.

Specific: 74th percentile in memory for words, and advanced math; 58th percentile in table reading.

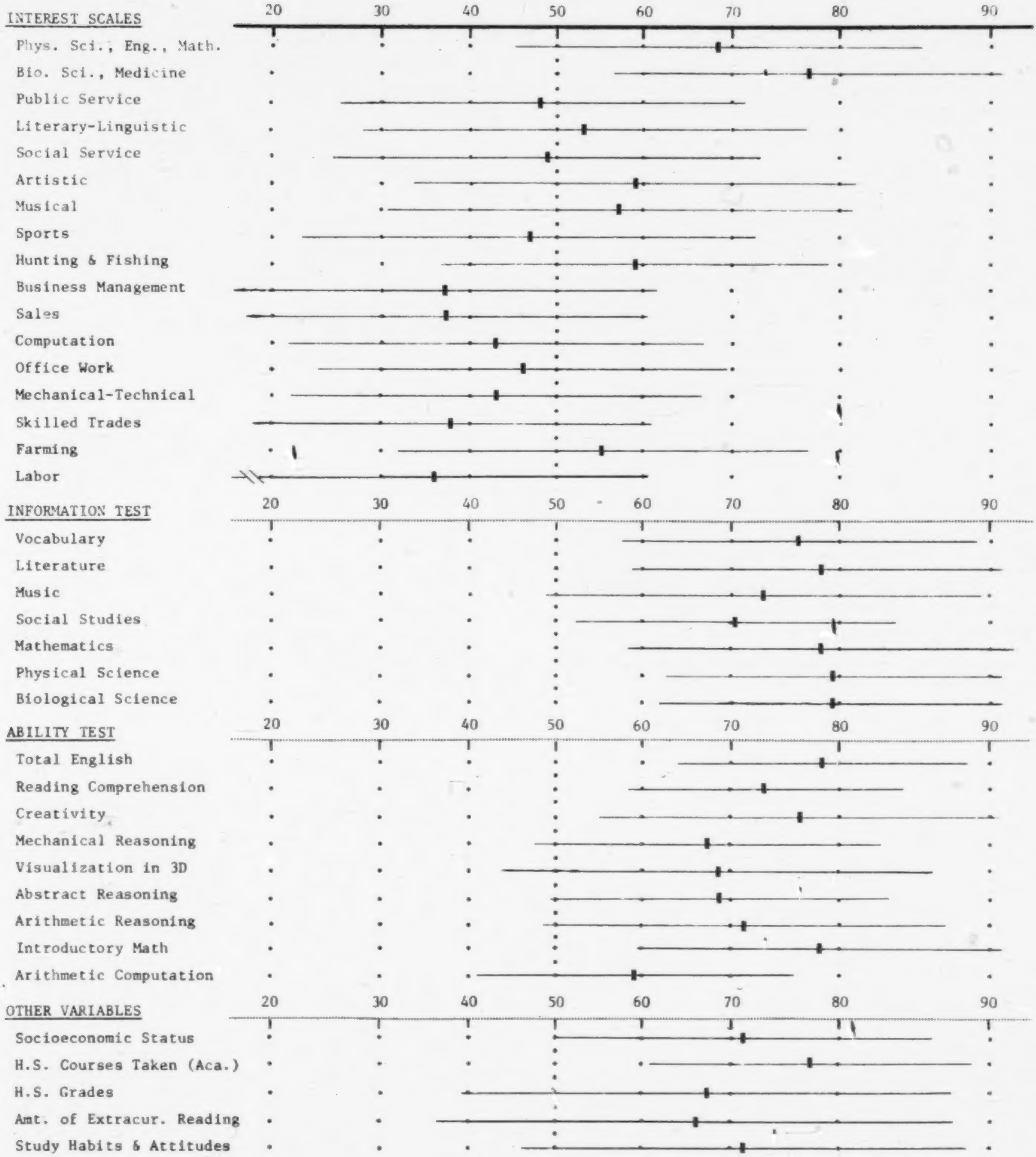
Others

General: High (77th percentile) in academic orientation of high school courses; low (66th percentile) in extracurricular reading.

Specific: High (67th percentile) in self-perception of reading skills.

BIOLOGIST, ZOOLOGIST

(Male - n = 124)



DENTIST

Importance: For most persons, dental care essential to prevent decay and loss of teeth, which would affect nutrition and general health.

Training: Good manual skill, good visual memory and judgment of size and space are necessary in this field.

Dental education is long and expensive. Student must have at least two years of college, with several science courses, before entering 4-year dental school. More than half of dental students have bachelor's degrees. Much competition for admission to dental school. First two years of dental school are spent in class work and remainder in clinical training. In addition, dentists often take graduate work or serve an internship or residency. State licensing examination required of graduates. In Delaware, one year's hospital internship also required. Some states require specialist to have 2-3 years of graduate education and several years' experience in specialty, and to pass additional state examination.

Typical Work Activities: Dentists clean, fill, straighten, and pull teeth, treat gum diseases, take X-rays, and make artificial dentures. They may be helped in some of these tasks by assistants or by a dental laboratory. May do oral surgery on gums and jaws.

About 9% of dentists specialize in such fields as tooth-straightening, making dentures, children's dentistry, or diseases of the mouth. A few teach and do research; others serve in the armed forces and work for the federal government or in other health agencies, but the great majority are in private practice.

Supervision; Social Relations: After the period of internship or residency most dentists are largely free of supervision. Good relations with patients important to practice.

Salary; Other Benefits: In 1970 average income of dentists about $29,000. In federal service beginning dentists started at $11,905 to $14,192.

Role of Sexes: In 1970, one to two percent of dentists women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (83rd percentile) in biological science and medicine; high (70th percentile) in physical science, engineering and math; lowest (31st percentile) in skilled trades, and labor.

Information

General: Average around 78th percentile on information scores; highest (84th percentile) in mathematics; lowest (73rd percentile) in music.

Specific: 71st percentile in health.

Abilities

General: Around the 73rd percentile on ability scores; highest (82nd percentile) in English, and introductory math; lowest (69th percentile) in mechanical reasoning.

Specific: 74th percentile in memory for words.

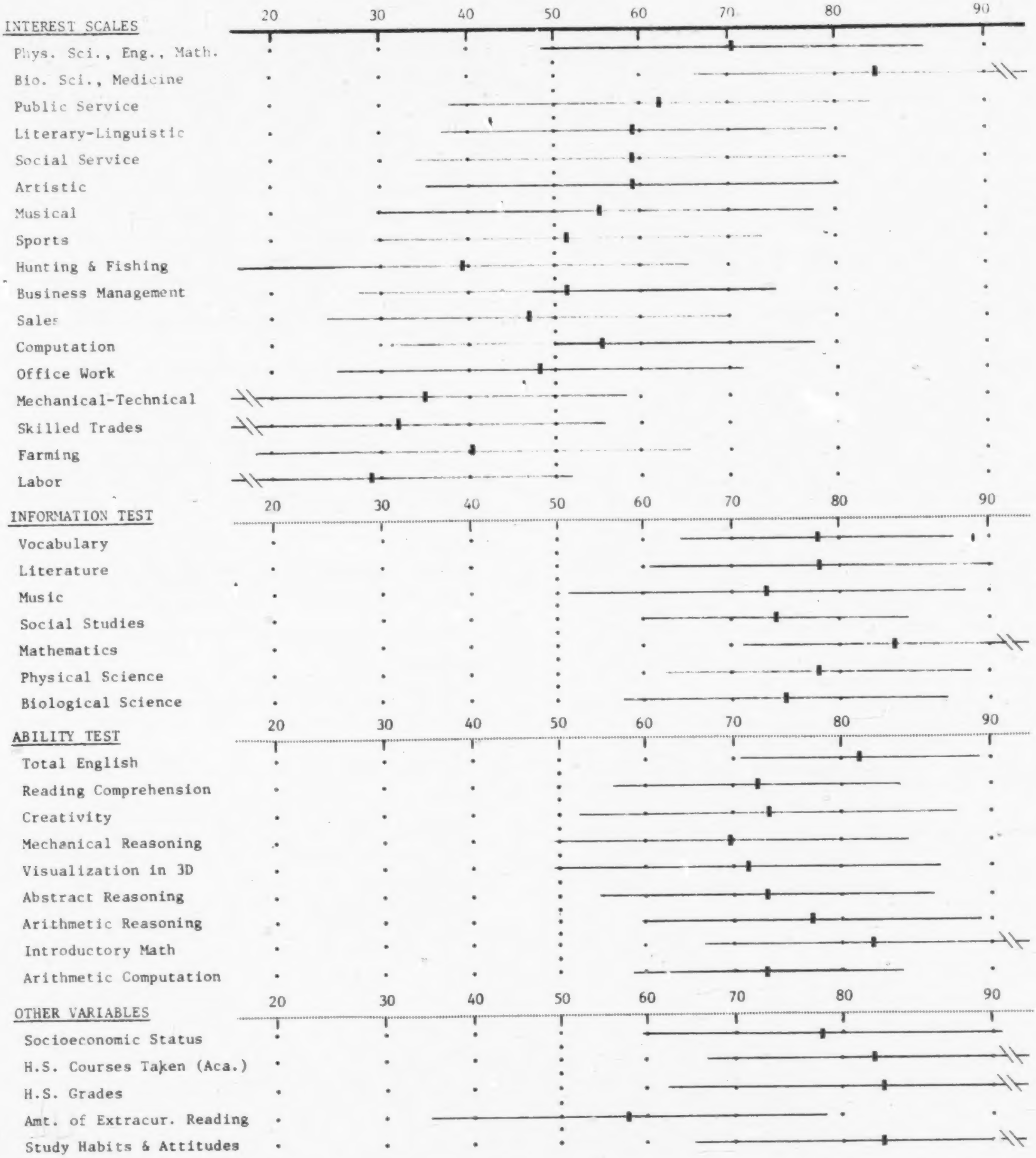
Others

General: High (83rd percentile) in high school grades, and study habits and attitudes; low (58th percentile) in extracurricular reading.

Specific: High (75th percentile) in maturity; 62nd percentile in sociability; 67th percentile in self-perception of reading skills.

DENTIST

(Male - n = 260)



NURSE - RN

Importance: Good nursing increases patient's chance of recovery; diminishes pain. Nurse puts into effect the curative measures recommended by physician.

Training: Registered nurse must have state or D.C. license to practice; license requires graduation from approved nursing school plus State Board examination.

All nursing schools require that applicant be high school graduate. Can take diploma course, 3 years of training given by hospitals and independent schools; baccalaureate course, 4 years, and in some schools 5, given by college or university; or associate degree course taking about 2 years in a junior or community college. Courses include both classroom and practical instruction.

Master's degree often required for positions in supervision, administration, the teaching of nursing, or nursing specialties. In public health agencies, should have degree in public health nursing.

Work Activities: Most registered nurses are hospital nurses, who do skilled bedside nursing, work in operating and recovery rooms, supervise nurses' aids, do psychiatric nursing, hold administrative positions, etc. Private duty nurses care for individual patients. Office nurses work for physicians or dentists, may do laboratory or office work. Public health nurses give patients care in clinics or homes, teach classes on diet etc., work with teachers, parents, community leaders to improve health of community. Nurse educators teach nursing students, conduct courses for nurses. Occupational health or industrial workers treat minor injuries and illnesses at factories, etc., help with physical examinations, give classes and advice. Nurse may specialize as nurse anaesthetist, psychiatric nurse, pediatric nurse, etc. Nurses eligible for military commissions.

In 1970 over two-thirds of registered nurses worked in hospitals, nursing homes, and similar institutions. Over one-fourth of nurses were part-time workers.

Outcomes: Recovery of patient or lessening of physical and mental suffering; patient instructed in habits and procedures necessary for good health.

Supervision; Social Relations: Supervision by head nurse and by physicians. Nurse must be willing to carry out doctor's instructions exactly. Good personal relations with patients necessary for their best progress.

Salary; Other Benefits: In 1970 nurses working in hospitals started at about $7,400, those in nursing homes at a little less. Industrial nurses averaged $147 a week, private-duty nurses $26-$44 a day. Veterans Administration nurses with diploma or associate degrees but inexperienced started at $7,294; those with baccalaureate degrees at $8,519. Other federal agencies started nurses with an associate degree and one year of experience, or nurses with baccalaureate degrees or diplomas, at $6,548.

Nurses working in hospitals usually have paid vacations, health benefits, and retirement provisions.

Role of Sexes: About 1% of the registered nurses who are working are men. Men nurses can now be commissioned in the military services. Military experience as medical or hospital corpsman makes excellent background for nursing.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (82nd percentile) in biological science and medicine; high (70th percentile) in physical science, engineering and math; low (42nd percentile) in business management, sales, and computation; lowest (27th percentile) in office work.

Information

General: Average around 74th percentile on information scores; highest (79th percentile) in mathematics; lowest (70th percentile) in music.

Specific: 68th percentile in health.

Abilities

General: Around the 70th percentile on ability scores; highest (78th percentile) in introductory math; lowest (64th percentile) in arithmetic computation.

Specific: 68th percentile in memory for words.

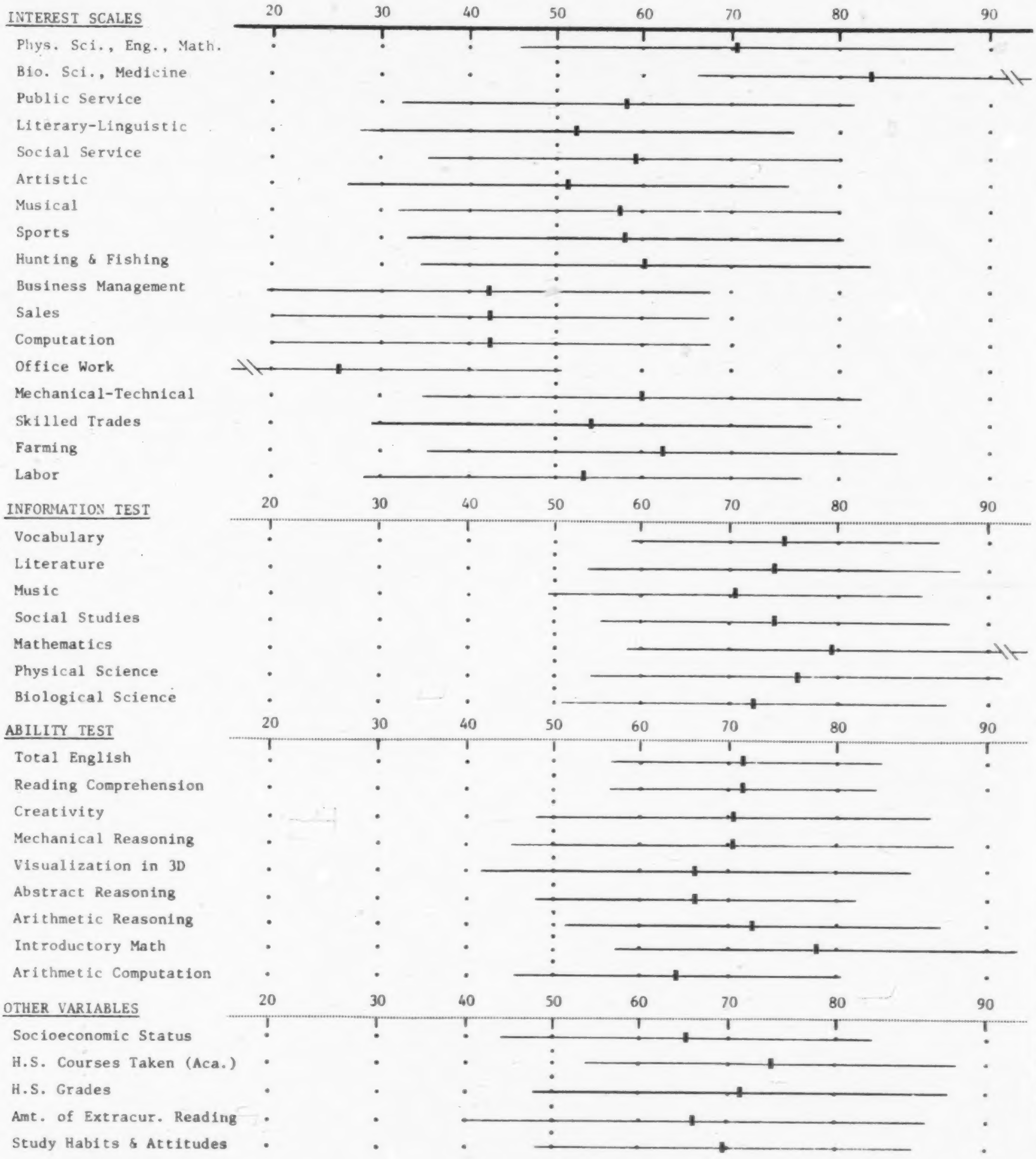
Others

General: High (74th percentile) in academic orientation of high school courses; low (66th percentile) in socioeconomic status, and extracurricular reading.

Specific: 48th percentile in sociability; 59th percentile in self-confidence, and self-perception of reading skills.

NURSE - RN

(Female - n = 2,260)



PHARMACIST

Importance: Patient needs to obtain drugs prescribed for him by physician. Consumer also requires vitamins, non-prescription remedies, medical equipment. Having these dispensed by person with scientific knowledge of drugs contributes to safety of purchaser.

Training: Graduation from a school or college of pharmacy required plus state licensing based on examination and, in most states, a period of supervised work. For entrance into college of pharmacy, high school courses in science and mathematics, followed by college courses in these fields are usual requirements. Graduation from a college of pharmacy usually requires at least five and sometimes six years of work beyond high school.

Master's or doctor's degree in pharmacy or related field usually required for research or teaching; desirable for work in hospitals. Sometimes possible to combine hospital internship with graduate study.

Work Activities: Fills prescriptions for drugs and medicines for curing various diseases and combatting infections. Advises on the use of non-prescription remedies for minor medical afflictions and the maintenance of health. Maintains records of drug supplies and sales. Sells other drugstore items to customers; may manage business as owner or part owner. About half of retail pharmacists owners or partners.

In drug companies, hospitals, and governmental agencies, maintains stocks of drugs, prepares drugs and other medical supplies, orders purchase of drugs and related supplies. In new specialty of clinical pharmacy, works as member of medical team to observe effect of drugs on patient and recommend changes in medication or dosage.

Outcomes: Drugs or combinations of drugs compounded according to prescription, contributing to recovery of customer and to maintenance of health. Sales of drugs and a variety of other items. Profits from management of retail business.

Supervision; Social Relations: For licensed pharmacists, self-supervision according to professional standards. May be working for a store owner; or for a medical supervisor in hospital. In stores, interact with many people as customers.

Salary; Other Benefits: In 1970 beginning pharmacists usually earned $10,000-$14,000 year. In federal service started at $9,881 or $11,905. In community pharmacies generally earned $12,000-$17,000; more if owner or manager. Usually work 44 hours week; some more. Shorter hours in industry, government agencies, hospitals. If on salary usually get vacations, health insurance, etc.

Role of Sexes: Nearly 9 percent of pharmacists women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (76th percentile) in biological science and medicine; high (69th percentile) in physical science, engineering, and math; lowest (36th percentile) in mechanical-technical, skilled trades, farming, and labor.

Information

General: Average around 69th percentile on information scores; highest (79th percentile) in mathematics; lowest (52nd percentile) in vocabulary.

Specific: 70th percentile in health.

Abilities

General: Around the 66th percentile on ability scores; highest (76th percentile) in introductory math; lowest (58th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 70th percentile in memory for words.

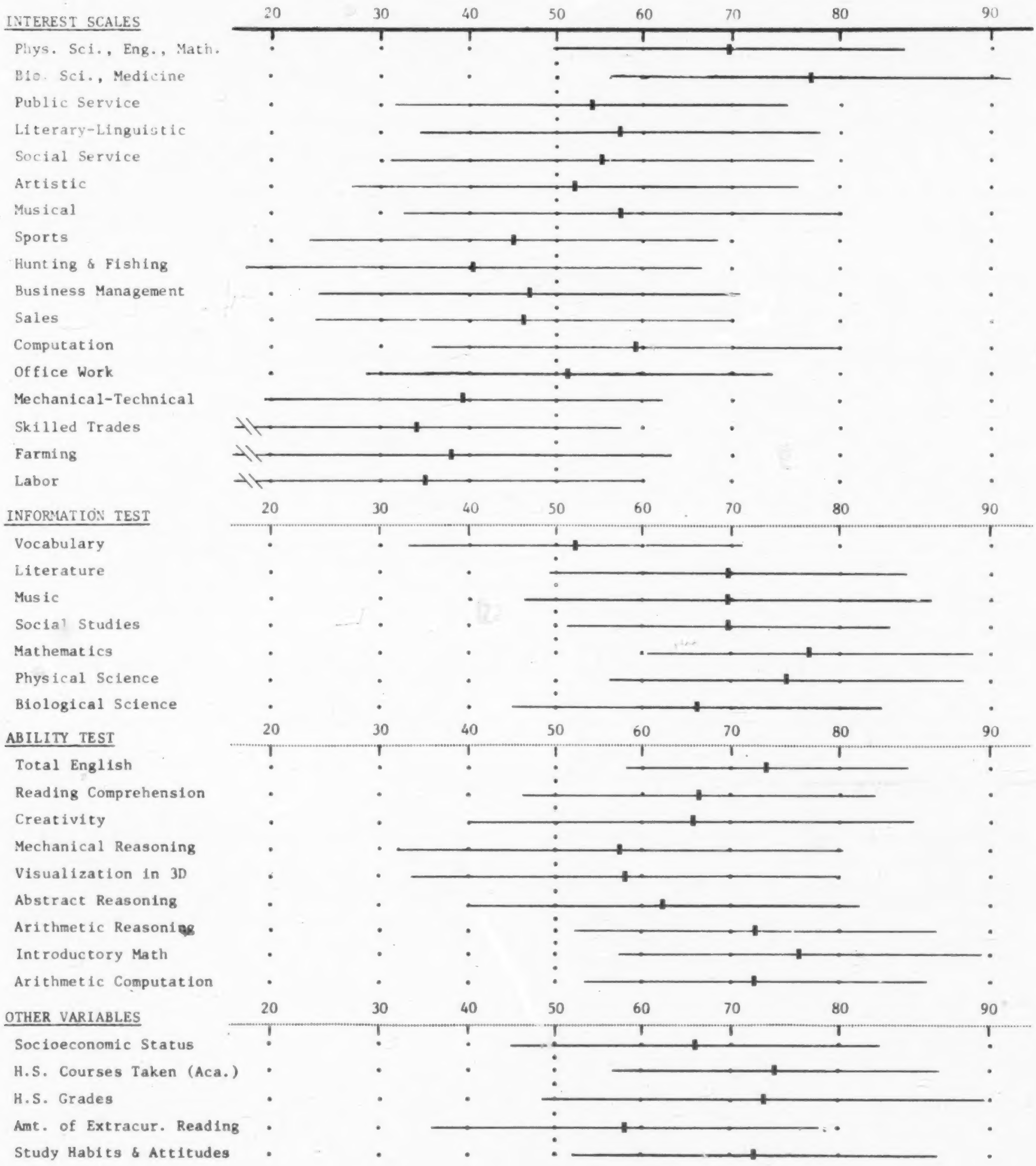
Others

General: High (71st percentile) in academic orientation of high school courses, high school grades, and study habits and attitudes; low (58th percentile) in extracurricular reading.

Specific: 54th percentile in sociability; 58th percentile in self-perception of reading skills.

PHARMACIST

(Male - n = 254)



PHYSICIAN

Importance: In increasingly urbanized world prevention of communicable disease a necessity. For many people individual well-being demands medical care.

Training: Medical training long, difficult, and expensive. Competition to get into medical school begins in high school. Many more applications to enter medical school than seats available in medical-school classes; many well-qualified applicants turned away. Unless student is academically outstanding or member of minority group his chances of entering an American medical school are slight. Some American students go to Latin America or Europe to study medicine.

Usually applicant must complete three years of college, with strong emphasis on science, before entering medical school. Most medical students earn bachelor's degree first. Medical College Admission Test usually required for entrance and student's entire record closely scrutinized.

Last two years of a four-year medical course are usually spent in clinical work. One-year hospital internship required, then graduate must take state licensing examination. If wants to be specialist spends two to four years' service as resident--for example, doctor who wants to be psychiatrist serves in psychiatric ward or psychiatric hospital--and takes additional examination.

Physician must continue informal study all his life to keep up with new medical developments.

Work Activities: Physician diagnoses and treats diseases and injuries; gives physical examinations; advises on preventive measures; gives vaccinations and inoculations to control spread of disease, supervises work of nurses and auxiliary medical personnel. May perform operations. Some physicians do part-time or full-time research or teaching. Some physicians administrators of hospitals, health services, etc. Some serve in armed forces (can enter Army with rank of captain) or in Public Health Service. Four-fifths of physicians specialists in particular diseases, parts of body, or methods of treatment.

Outcomes: Patient restored to health or better health; suffering alleviated, disease prevented in individuals or communities.

Supervision; Social Relations: In internship or residency doctor closely supervised by more experienced physicians. If works as member of clinical group, supervised by group. If treats hospital patients, treatment may be scrutinized by committee of doctors. Little supervision for physicians in private practice as individuals. For physicians in private practice good relations with patients essential; for all physicians good relations with group of physicians as a whole essential.

Salary; Other Benefits: Doctors have high average income. In 1970 net income of physicians in private practice estimated at $34,000-$39,000. Salaried physicians usually earned less; specialists more. Interns earned about $7,045-$7,435, residents $8,250 or $8,750. These salaries often include maintenance. In 1970, federal government paid physicians who had completed internship about $15,200; those with outstanding records or a year of residency $17,800.

Role of Sexes: About 7% women in 1970.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (89th percentile) in biological science and medicine; high (76th percentile) in physical science, engineering and math; low (27th percentile) in mechanical-technical, and skilled trades; lowest (22nd percentile) in labor.

Information

General: Average around 86th percentile on information scores; highest (89th percentile) in mathematics; lowest (79th percentile) in biological science.

Specific: 80th percentile in health.

Abilities

General: Around the 82nd percentile on ability scores; highest (89th percentile) in English, and introductory math; lowest (69th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 81st percentile in memory for words.

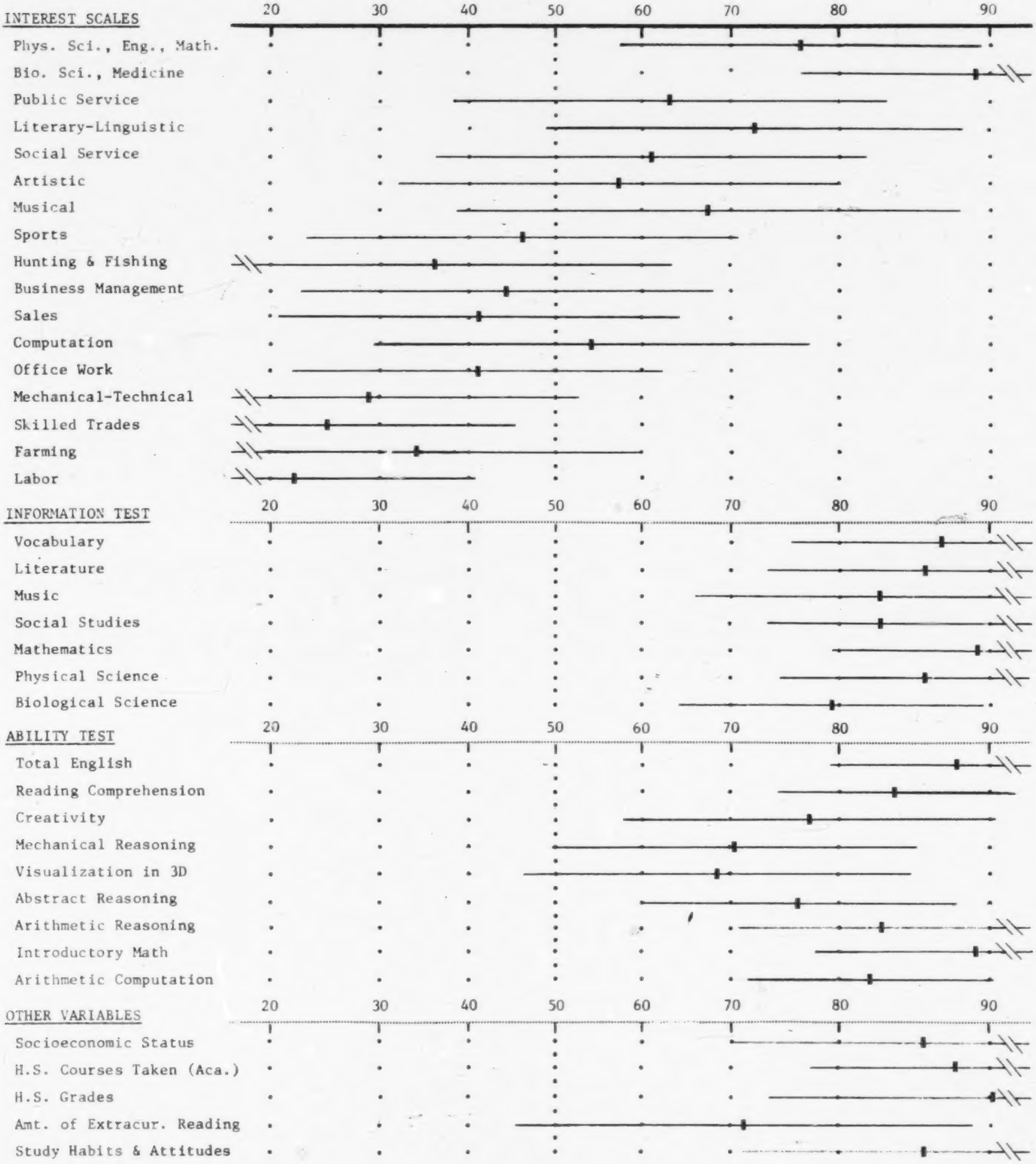
Others

General: High (90th percentile) in high school grades; low (71st percentile) in extracurricular reading.

Specific: High (78th percentile) in maturity; 56th percentile in sociability; 69th percentile in social sensitivity; 74th percentile in self-perception of reading skills.

PHYSICIAN

(Male - n = 591)



VETERINARIAN

Importance: Animals important in American agriculture; veterinarian makes it possible to produce meat at lower cost. Prevents spread of animal disease to humans. Care of pets contributes to quality of life.

Training: Veterinarian must have state license, which requires degree of Doctor of Veterinary Medicine, State Board examination, and in some states a period of practice under a licensed veterinarian. For research or teaching should have master's or Ph.D. degree in specialized field.

Degree of Doctor of Veterinary Medicine requires 2 years of preveterinary college work plus four years of veterinary college. Many spend 3 or 4 years in preveterinary college work. Veterinary college training includes both classroom and clinical experience, including diagnosis, surgery, and laboratory work.

Work Activities: Diagnoses, treats, and controls disease and injury among animals. Performs operations, gives drugs, does vaccinations and injections. Controls disease. May run animal hospital. Advises on care and breeding of animals. May specialize in some particular kind of animal--pets, farm animals, horses. Some veterinarians inspect meats and other foods; some teach or do research.

Outcomes: Healthier animals, safer food at lower prices; prevention of epidemics among animals and spread of animal disease to humans.

Supervision; Social Relations: After getting license, veterinarian relatively free of supervision. Good relations with customers essential.

Salary; Other Benefits: In 1970 beginning veterinarians going to work for federal government earned \$10,539 or \$11,905. Experienced veterinarians working for government usually earned \$13,500 to \$26,700. Income probably higher in private practice.

Role of Sexes: About 2% of practising veterinarians are women, but about 9% of the students in veterinary colleges in 1970 were women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (70th percentile) in biological science and medicine; high (66th percentile) in physical science, engineering and math, and farming; lowest (33rd percentile) in artistic, and labor.

Information

General: Average around 74th percentile on information scores; highest (82nd percentile) in physical science; lowest (67th percentile) in music.

Specific: 71st percentile in health.

Abilities

General: Around the 75th percentile on ability scores; highest (84th percentile) in introductory math; lowest (62nd percentile) in three-dimensional visualization.

Specific: 73rd percentile in memory for words.

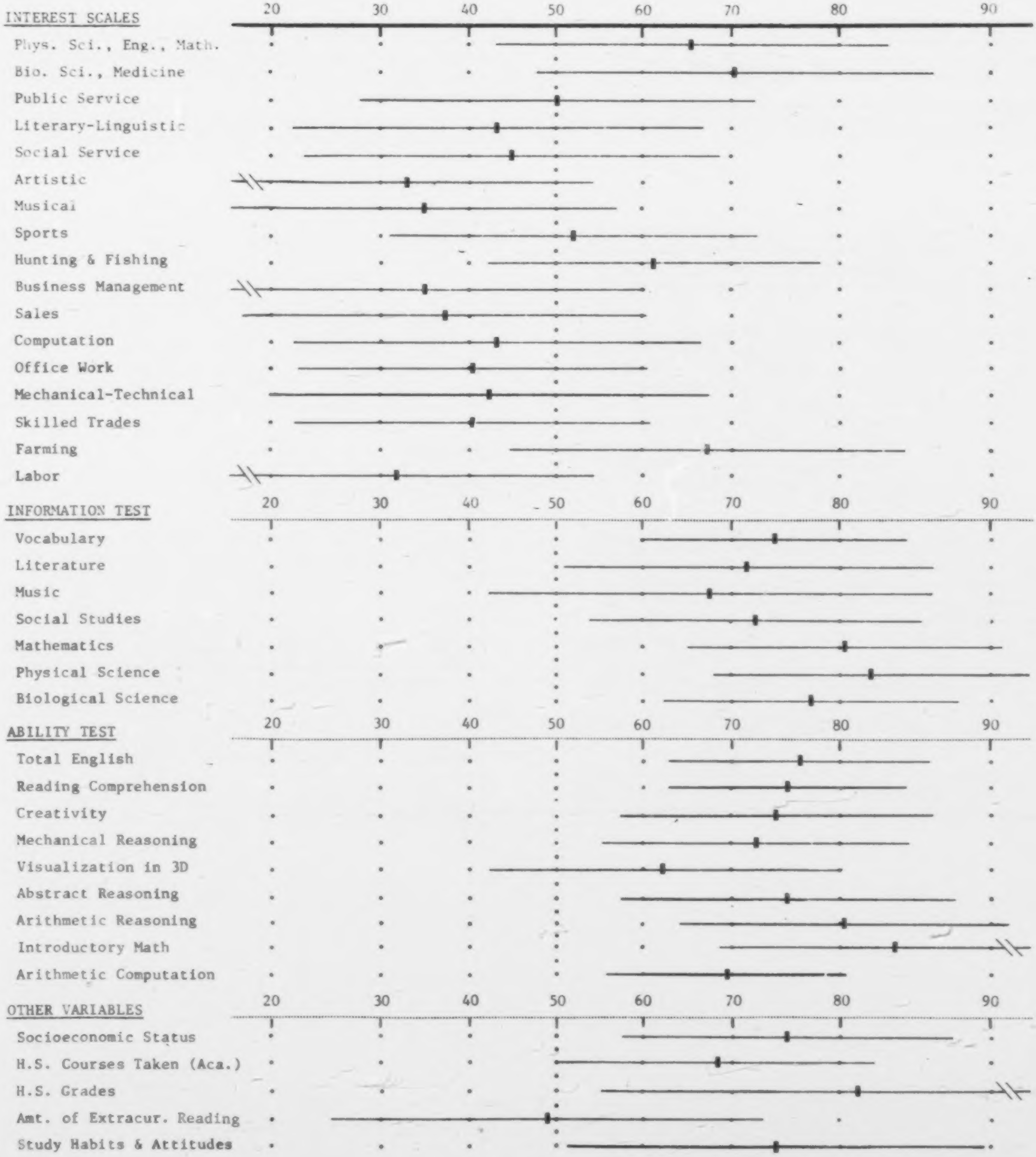
Others

General: High (81st percentile) in high school grades; low (49th percentile) in extracurricular reading.

Specific: High (71st percentile) in maturity; 52nd percentile in sociability; 60th percentile in self-perception of reading skills.

VETERINARIAN

(Male - n = 76)



WILDLIFE, CONSERVATION SPECIALIST

Importance: Effect of overpopulation and destruction of wildlife habitats raises danger of extinction of many species. Increasing public need for natural areas as places of rest and recreation.

Training: Forester needs bachelor's degree with major in forestry. For teaching and research, higher degree usually needed.

Ecologist needs bachelor's degree with major in one of the life sciences. Advanced degree usually needed for promotion.

Range manager needs bachelor's degree with major in range management or range conservation, or bachelor's in a related field with courses in range management and range conservation. Graduate degree needed for teaching or research.

Typical Work Activities: Forester manages, develops, and protects forests, including wildlife, though chief concern is with trees. Prevents fires, manages camps and parks. May specialize in wildlife management. About three-fourths employed by federal, state, and local government; some by paper industry, etc.

Ecologist studies relation between organisms and their environment. Some ecologists stress basic science but some also use their knowledge of ecology for conservation purposes.

Range manager, also called range conservationist or range scientist, manages rangelands (largely government-owned) and their resources. Balances interests of livestock, wildlife, etc. Decides on amount of livestock range is to carry, establishes pasture vegetation, reseeds damaged land, prevents fires. Majority employed by federal, state, and local governments.

Outcomes: Conservation of forests, range, and wildlife.

Supervision; Social Relations: Usually supervised by superiors in organization.

Salary; Other Benefits: In 1970 beginning forester with bachelor's degree going to work for federal government started at $6,548 or $8,098. With a year or two of graduate work started at $8,098 or $9,881; with Ph.D. at $11,905 or $14,192. District rangers for federal government usually earned $9,881 to $14,192 a year. Salary of ecologists similar to that of other biologists (see p. 62).

In 1970 beginning range managers with bachelor's degree going to work for federal government started at $6,548 to $8,098. With one or two years of graduate work started at $8,098 or $9,881; with Ph.D. $11,905 to $14,192. State and industry salaries about the same.

Role of Sexes: Forester and range manager mainly men's fields; some women now in ecology.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (73rd percentile) in hunting and fishing, and farming; higher (63rd percentile) in biological science; high (53rd percentile) in physical science, engineering and math; lowest (33rd percentile) in business management.

Information

General: Average around 70th percentile on information scores; highest (77th percentile) in biological science; lowest (59th percentile) in music.

Specific: Highest (80th percentile) in fishing; high (75th percentile) in hunting, and outdoor activities.

Abilities

General: Around 69th percentile on ability scores; highest (76th percentile) in introductory math; lowest (64th percentile) in three-dimensional visualization, and arithmetic computation.

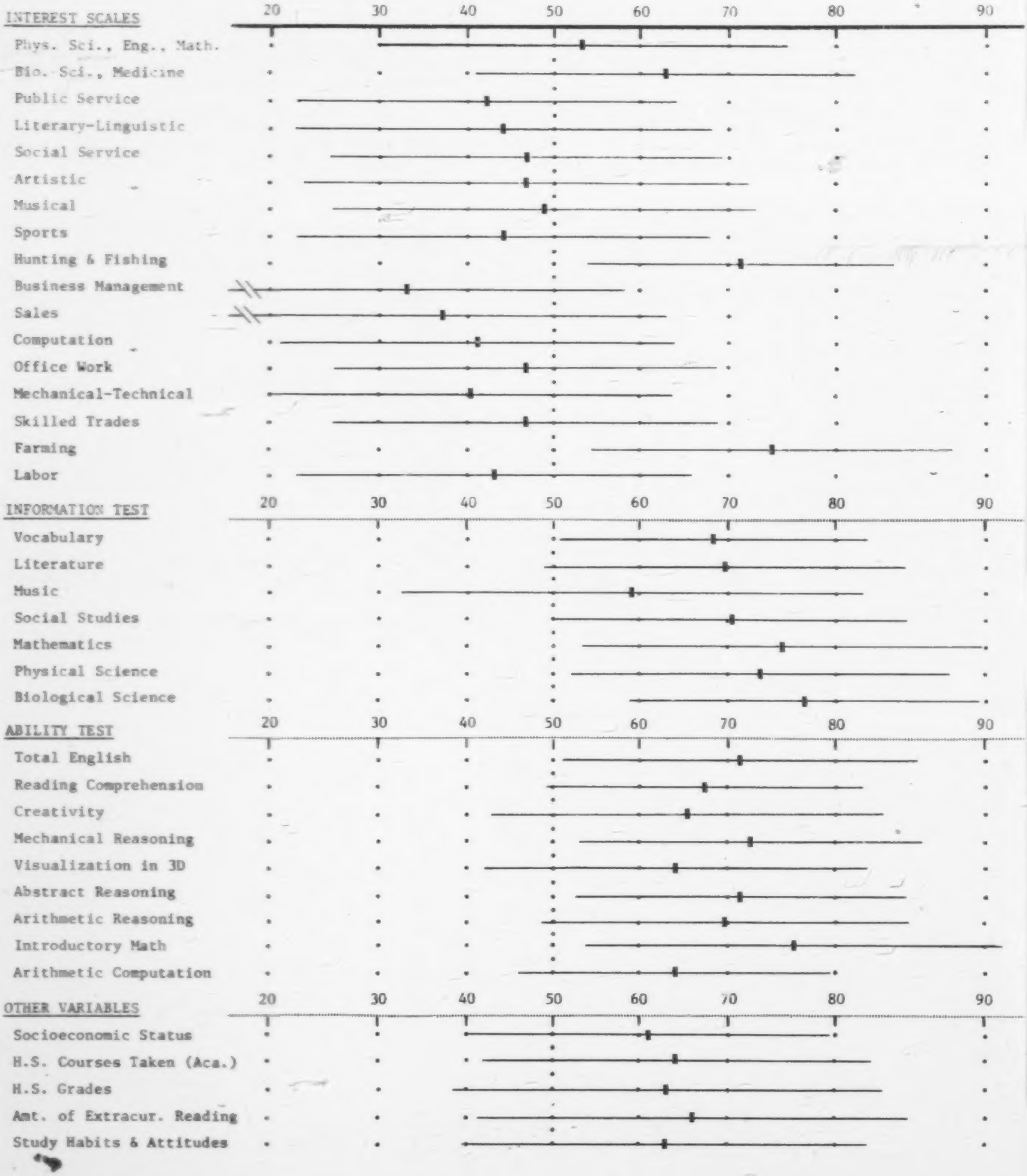
Others

General: High (66th percentile) in extracurricular reading; low (61st percentile) in socioeconomic status.

Specific: 46th percentile in social sensitivity; 59th percentile in self-perception of reading skills.

WILDLIFE, CONSERVATION SPECIALIST

(Male - n = 137)



CHAPTER 5

CAREER GROUP 3

Business Administration

In this Career Group, we have grouped all of the professional workers who have major roles in running businesses. We have included the following occupations in this Career Group:

Accountant, Auditor, Comptroller (A)
  (See Certified Public Accountant)
Advertising Worker (B)
Business Administration and Management (not elsewhere classified) (C)
Certified Public Accountant (D)
  (See Accountant, Auditor, Comptroller)
Efficiency Expert, Industrial Engineer, Production Manager (not elsewhere classified) (E)
Finance Worker (F)
Industry, Business, Commerce, (not elsewhere classified) (G)
Investment Consultant (H)
Manufacturing Management (I)
Marketing and Wholesale/Retail Trade Manager (J)
Military Officer (K)
Personnel Administration (L)
Pilot (M)
Purchasing Agent (N)
Retail Buyer (Females) (r)
Stockbroker (S)
Teacher--Commercial Education (Females) (t)

Some of these workers manage entire businesses; others are responsible for planning and directing the activities of only one department, such as the accounting or personnel department. However, all of these workers in business administration are responsible for keeping things going in a business.

Occupations in this group vary greatly in the amount of training and skills required of workers. In general, however, chances of success in business administration are improved with a college degree.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest scores (55th percentile) in natural sciences, public service, and computation; lowest (36th percentile) in hunting and fishing, mechanical-technical, skilled trades, and labor.

Information

General: Average around 60th percentile on information scores; highest (65th percentile) in literature, music, and mathematics; lowest (55th percentile) in biological science.

Specific: High (65th percentile) in accounting, business and sales.

Abilities

General: Around the 60th percentile on ability scores; highest (65th percentile) in English, and introductory math; lowest (50th percentile) in mechanical reasoning.

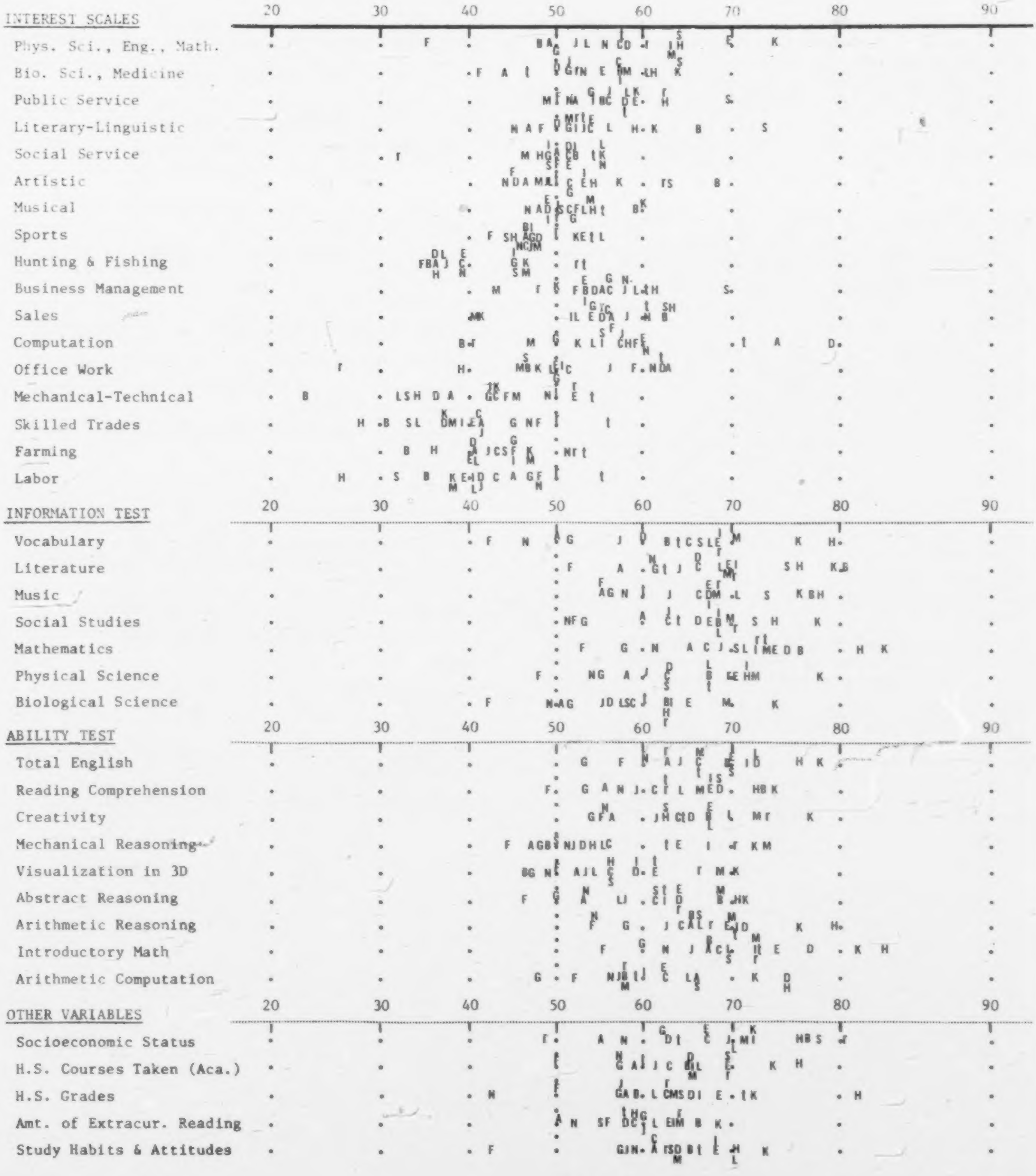
Others

General: High (65th percentile) in socioeconomic status; low (57th percentile) in extracurricular reading.

Specific: 55th percentile in sociability, social sensitivity, and self-perception of reading skills.

CAREER GROUP 3

Business Administration



ACCOUNTANT, AUDITOR, COMPTROLLER

Importance: As business, and the relation of business with government, become more extensive and complex the need for accountants has increased. The work of accountants enables employers to check on efficiency and profit of business operations and to guard against dishonesty.

Training: College degree, with a major in accounting or a related business field, desirable but not officially required of entrants to an accounting career. However, half the states in 1970 stipulated that certified public accountants must have a college degree. Part of an accountant's education is usually acquired through on-the-job training. Ability to use computers becoming an important addition to accountancy skills. Continuous study needed to keep up with changes in economic conditions and governmental regulations.

Work Activities: Analyzes financial records and prepares reports. May work in public, management, or government accounting. Many specialties in accounting field. Public accountants audit, advise on tax matters and financial problems, prepare income tax reports. Management accountants work for business firms; provide data for decisionmaking. Government accountants audit income taxes, governmental funds and expenses, etc. Auditor carries out official examination of accounts, reviews business situations. Comptroller supervises accounts; determines propriety of expenditures.

Outcomes: Financial records and interpretations of records useful to employer. Verification of financial records.

Supervision; Social Relations: Beginning accountants work under supervision of senior accountants. Certified public accountants often work without supervision.

Salary; Other Benefits: Accountants in private industry began at about $8,500 in 1970. In government accountants and auditors began at $8,510 or $9,178. In government many over $15,000. In private industry accountants with experience averaged $10,500 to $15,500. Beginning auditors averaged $9,000 a year; salaries of experienced auditors $11,500-$14,000.

Role of Sexes: In 1970 less than 20% of accountants women; about 2% of Certified Public Accountants women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (69th percentile) in computation and office work; high (56th percentile) in business management and sales; low (39th percentile) in hunting and fishing, mechanical-technical, skilled trades, and farming.

Similar to: Certified Public Accountant except for higher interests in business management and sales.

Information

General: Average around 57th percentile; highest (65th percentile) in mathematics; lowest (50th percentile) in vocabulary and biological science.

Specific: High (63rd percentile) in accounting, business and sales.

Similar to: Certified Public Accountant

Abilities

General: Around 61st percentile in ability scores; highest (67th percentile) in introductory mathematics and arithmetic (reasoning and computation); moderately high (59th percentile) in English and creativity; lowest in mechanical reasoning, and three-dimensional visualization.

Specific: 68th percentile in table reading.

Similar to: Certified Public Accountant

Others

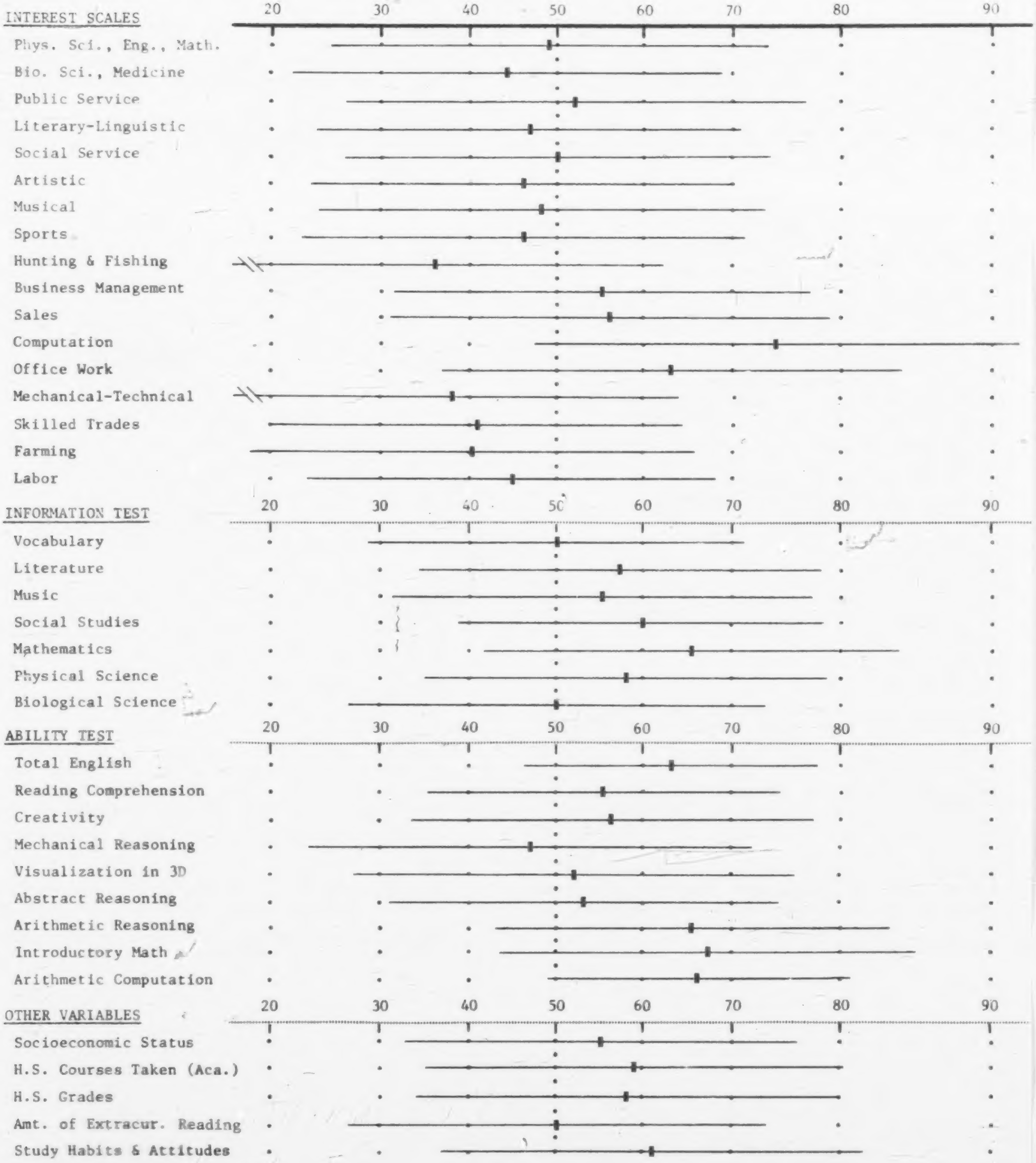
General: High (61st percentile) in study habits and attitudes; low (50th percentile) in extracurricular reading.

Specific: 51st percentile in self-perception of reading skills.

Similar to: Certified Public Accountant

ACCOUNTANT, AUDITOR, COMPTROLLER

(Male - n = 721)



ADVERTISING WORKER

Importance: Prosperity of our economic system depends on continuing demand for goods and services, but people can't want something until they know it exists. Advertising tells them what is available and what its desirable points are, thus stimulating the desire to buy.

Training: College education desirable but not essential. Most employers prefer college graduates with liberal arts, business, or journalistic training, but ability and persuasiveness more important. Experience in high school or college journalism is desirable, as is summer work in such areas as market research.

Work Activities: These vary with the type of job the advertising worker has.

An advertising manager works for a manufacturer and directs his company's advertising program to sell his company's products. He decides what kind of advertising campaign to put on, chooses an advertising agency, and supervises it in developing the campaign. An advertising manager who works for a newspaper, radio station, etc. gets advertisers to use his medium for their advertisements.

The account executive is responsible for relations between his advertising firm and the people who hire it to put on programs of advertising. He works out ideas for good advertisements, has them completed by copywriters and artists, and then tries to convince the client that they are good.

Advertising copywriters do the printed part of an advertisement. They study the product and people's reasons for buying it or not buying it, then write advertisements that they hope will influence purchases.

Artists and layout men prepare the pictures used in advertisements.

Media directors decide what magazines, radio stations, etc. should carry certain advertising so that it will reach the greatest number of people who might be interested in the product.

Production managers, with their staff, put the advertisement into printed form. This requires knowledge of printing and other methods of reproduction.

Research directors collect the information needed for preparing advertisements. They study the product, its competitors, and the habits and preferences of the people who might buy it, to help decide how and where to advertise it.

Outcomes: The desirable intermediate outcome for an advertising worker is to help prepare an ad that the client will like and accept. The desirable final outcome is to have the ad succeed in selling the product.

Supervision; Social Relations: In a sense all advertising workers, when working on a particular advertising campaign, are under the supervision of the client. More specifically, however, they are under the account executive. The preparation of an advertising campaign is a highly cooperative project that requires fitting together the work of various people.

Salary and Other Benefits: Workers in small advertising agencies averaged $11,000 a year in 1970; those in large agencies $26,000 a year. Account executives earn more than the average advertising worker.

Role of Sexes: Both men and women are employed in advertising. Many women enter advertising by working in the advertising departments of retail stores.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: High scores (65th percentile) in literary-linguistic, artistic, and sales activities; low (below 35th percentile) in hunting and fishing, mechanical-technical, skilled trades, farming and labor.

Information

General: Average around 68th percentile; highest (80th percentile) in literature; high (77th percentile) in music, and mathematics; low (63rd percentile) in vocabulary, and biological science.

Specific: High (80th percentile) in art; 73rd percentile in accounting, business and sales.

Abilities

General: Around the 67th percentile on ability scores; highest (73rd percentile) in reading comprehension; lowest (48th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 65th percentile in memory for words.

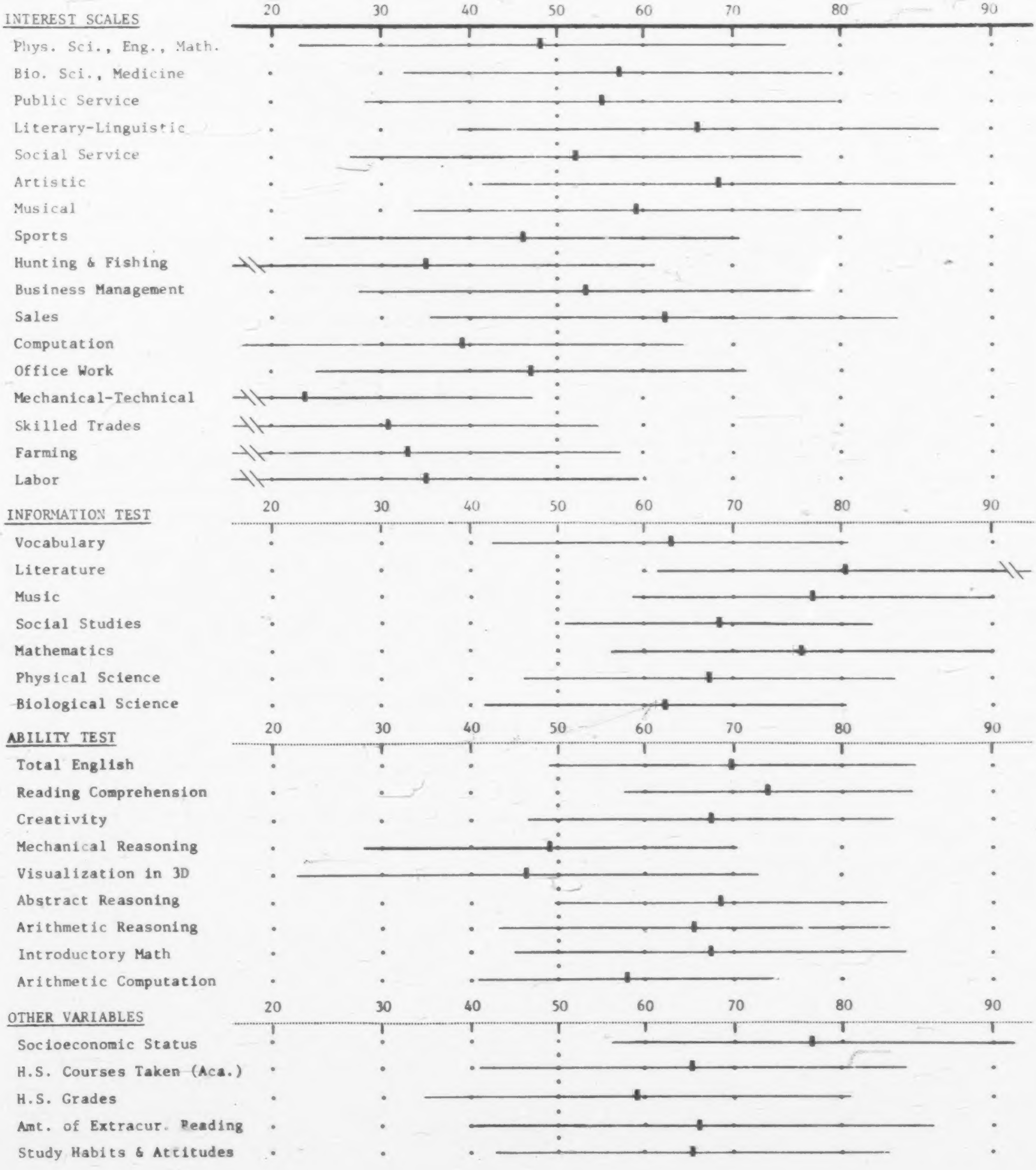
Others

General: High (75th percentile) in socioeconomic status; low (59th percentile) in high school grades.

Specific: 61st percentile in social sensitivity; 65th percentile in self-perception of writing skills.

ADVERTISING WORKER

(Male - n = 96)



BUSINESS ADMINISTRATION and MANAGEMENT
(not elsewhere classified)

Importance: As businesses grow larger more managers are required, and business managers have been increasing in number. Manager coordinates efforts of others to meet interim and end goals; directs efforts to meet deadlines, provides unity of action.

Training: Sometimes no formal educational requirements. Managers are often promoted up through the ranks; in this case they may not have college degrees. But when an employer hires a young man to be trained as a manager he usually wants him to have a college degree. Some of them want this degree to be in business administration. Technical training in fields related to the business in which one is to be a manager is also an advantage, but some liberal arts graduates are hired and given on-the-job training.

Work Activities: Business managers plan and supervise the work of others and may engage in policymaking. The lowest and largest level of business manager is the supervisor, who usually directs workers in some particular branch of activity within the company. The middle-level manager may be a department head. Top-level managers may decide on what kind of products or services their firm should produce, and similar matters of high-level policy. They include directors, vice-presidents, etc. The highest-level manager is the president or chairman of the board. Each vice president may be in charge of a department or product.

Managers are not tied to any particular branch and switch easily from one managerial job to another. Trainees may be delegated to assist lower-level managers, or they may be switched from job to job in various parts of the business so that they can learn more about it. Managers work in all branches of industry, especially wholesale and retail trade and manufacturing. They are employed by government offices, and by real estate companies, banks, and similar businesses.

Outcomes: Products that will sell at a profit; services contributing to the efficiency of the organization.

Supervision; Social Relations: Supervised by superiors in organization. Good social relations upward and downward essential.

Salary; Other Benefits: In 1970 management trainees with bachelor's degrees usually earned $7,500 to $10,500 a year in private industry; those with master's degrees $10,800 to $14,000. In the federal government began at $8,098; with master's or good qualifications at $9,881.

Middle-management salaries in 1970 generally ranged from $10,000 to $35,000 a year; $50,000 in some large companies. Top manager averaged $45,000 in small companies but $200,000 or more in large corporations. Also get bonuses, stock options, club memberships, etc. Travel and night work often required.

Role of Sexes: About 85% of managers men. Women's best management opportunities in retail trades.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (57th percentile) in natural sciences, and computation; lowest (41st percentile) in hunting and fishing, mechanical-technical, skilled trades, farming, and labor.

Similar to: Advertising

Information

General: Average around 65th percentile on information scores; high (67th percentile) in mathematics; low (59th percentile) in biological science.

Specific: High (65th percentile) in accounting, business and sales.

Similar to: Advertising

Abilities

General: Around the 62nd percentile on ability scores; high (67th percentile) in English, and introductory mathematics; low (56th percentile) in mechanical reasoning and three-dimensional visualization.

Similar to: Advertising

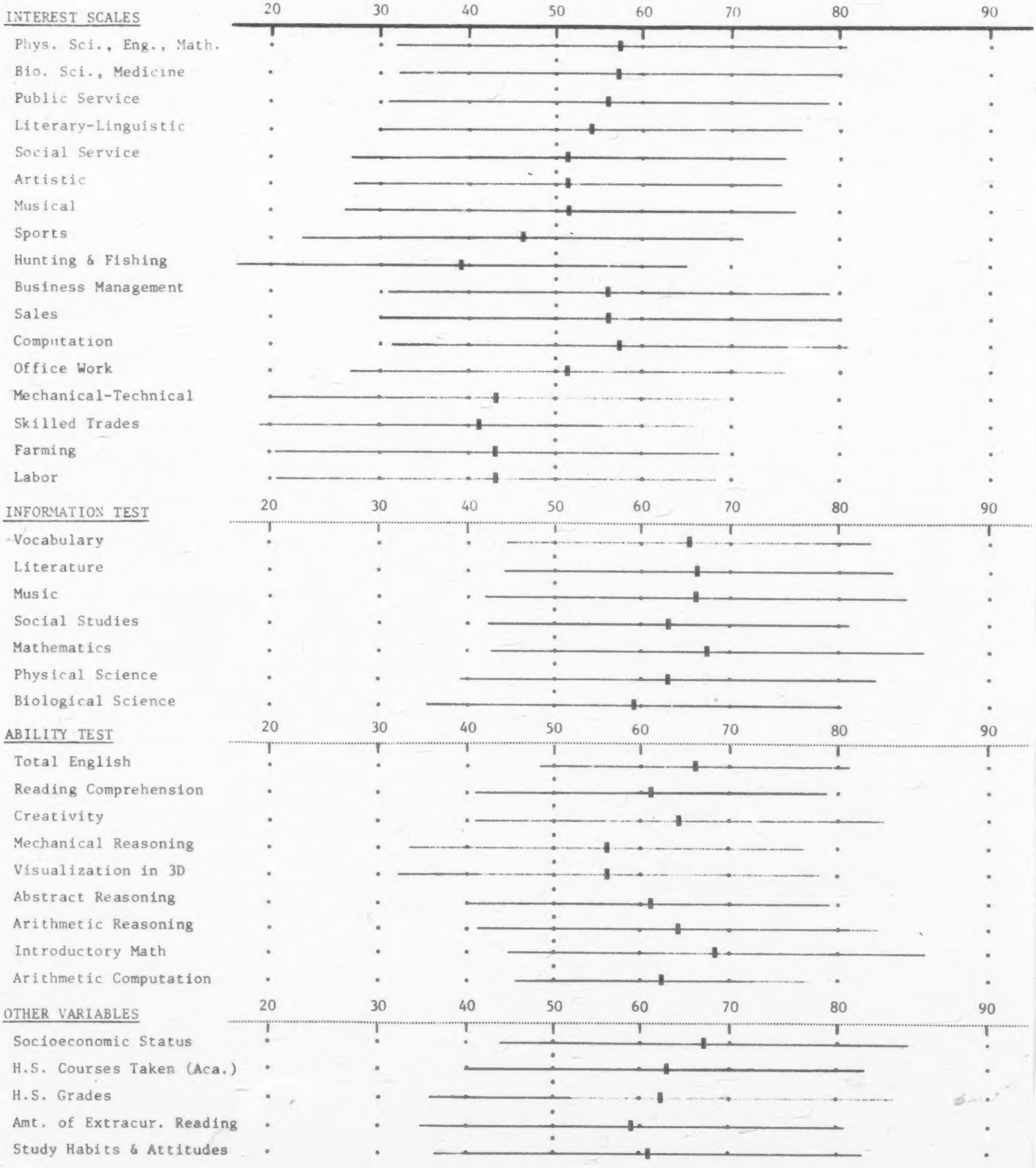
Others

General: High (67th percentile) in socioeconomic status; low (59th percentile) in extracurricular reading.

Specific: 60th percentile in sociability, social sensitivity, and self-confidence.

BUSINESS ADMINISTRATION and MANAGEMENT
(not elsewhere classified)

(Male - n = 1,582)



CERTIFIED PUBLIC ACCOUNTANT

Importance: Highly trained accountants necessary for difficult problems of accounting and financial inspection. Certified Public Accountant system does much to guarantee responsibility and efficiency of accountant. About one-fifth of all accountants are CPA's.

Training: The difference between an accountant and a certified public accountant is a matter of ability, training, experience, and licensing. Training available in colleges, universities, business schools, correspondence schools. To work as a certified public accountant one must have a certificate from the state board of accountancy. The same examination is used in all states. In 1970 half the states required certified public accountants to be college graduates. Nine-tenths of new CPA's are college graduates; most others have had some college training. Some states are considering requiring them to have higher degrees. If they are teaching accountancy in a college or university, they need master's or doctor's degrees. Two years of public accounting experience required to become a certified public accountant. Therefore, a certified public accountant has to begin as an ordinary accountant.

A certified public accountant has to continue studying even after he has been licensed in order to keep up with new developments in his field, in business, and in government. For example, knowledge of computer operation has now become desirable and, for some work, necessary.

Work Activities: Work on a fee basis or as part of an accountancy firm, or for government. Often specialize in auditing financial reports to determine whether they are accurate and can be believed. May also advise clients on taxes or other financial problems. May specialize in various fields, such as taxes.

Usually begin with routine work; takes 2-4 years to rise to senior positions.

Outcomes: Correct evaluations of financial situations examined; location of errors or discrepancies in accounting; sound advice to employer.

Supervision; Social Relations: Supervised by superior in firm where employed.

Salary; Other Benefits: Starting salaries of beginning accountants in private industry about $8,500 a year in 1970. Experienced accountants averaged $10,500-$15,500. Beginning auditors averaged $9,000, experienced auditors $11,500 to $14,000. In federal service junior accountants and auditors started at $8,510 or $9,178 a year. Many experienced accountants earned $15,000 or more. CPA's usually earn about 10% more than other accountants. May work long hours or have to travel.

Role of Sexes: About 2% of CPA's are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (79th percentile) in computation; high (62nd percentile) in office work; lowest (40th percentile) in hunting and fishing, mechanical-technical, skilled trades, farming, and labor.

Similar to: Accountant, auditor, and comptroller except for more than average interest in business management and sales.

Information

General: Average around 66th percentile on information scores; high (75th percentile) in mathematics; low (56th percentile) in biological science.

Specific: High (68th percentile) in accounting, business, and sales.

Similar to: Accountant, auditor, comptroller.

Abilities

General: Around the 68th percentile on ability scores; highest (76th percentile) in introductory math, and arithmetic computation; lowest (56th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 75th percentile in advanced math; 70th percentile in table reading.

Similar to: Accountant, auditor, comptroller.

Others

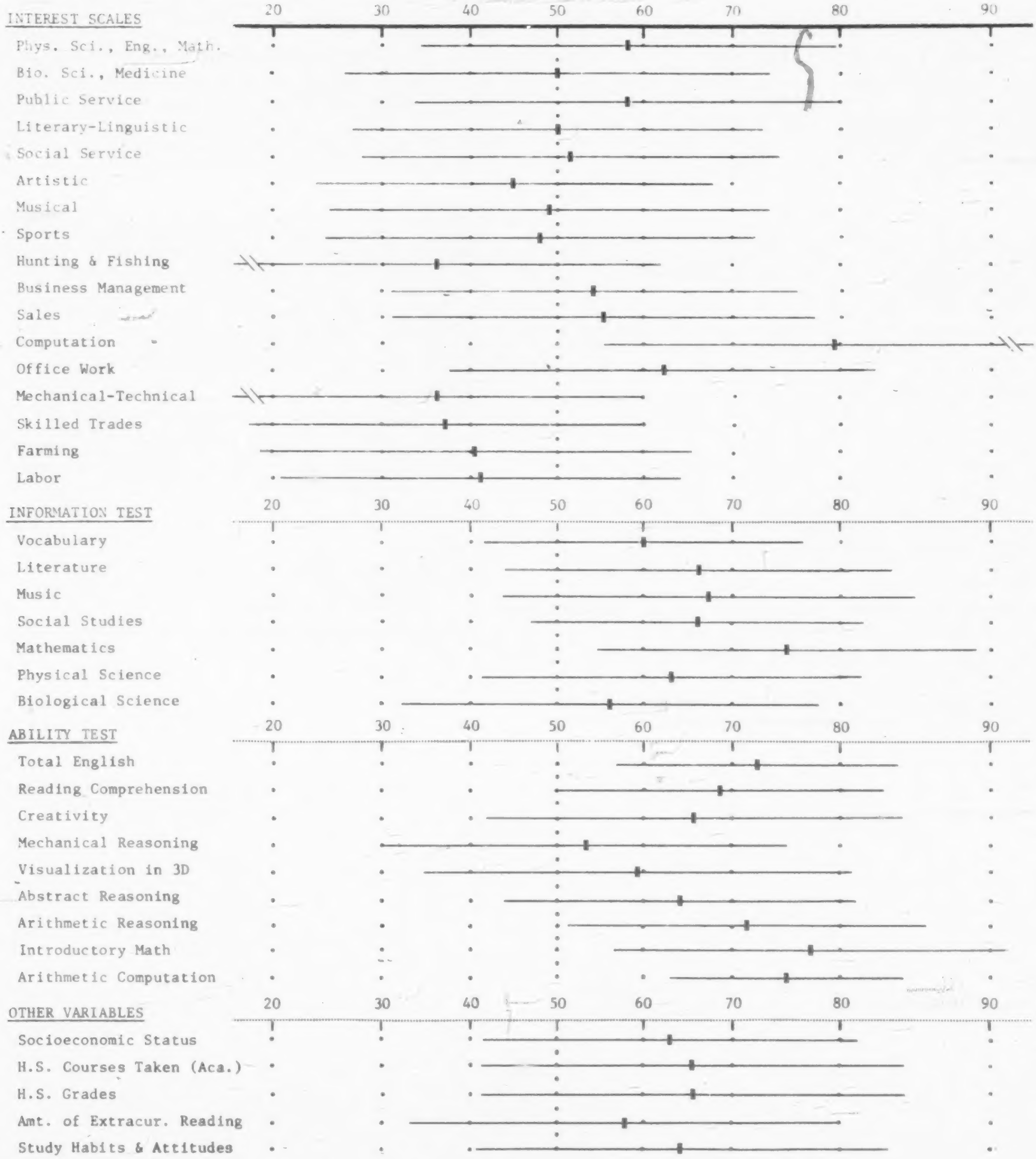
General: High (65th percentile) in academic orientation of courses, and high school grades; low (58th percentile) in extracurricular reading.

Specific: 53rd percentile in self-perception of reading skills.

Similar to: Accountant, auditor, and comptroller.

CERTIFIED PUBLIC ACCOUNTANT

(Male - n = 728)



EFFICIENCY EXPERT, INDUSTRIAL ENGINEER, PRODUCTION MANAGER (not elsewhere classified)

Importance: Necessary because of complexity of industrial operations, coming of automation, growth of large industries, new labor problems.

Training: For training of industrial engineers, see section on engineers in general (p. 30). Efficiency experts often grow into this field from other branches of business. May have business training or training in economics. College degree usually required. Often work for consulting firms. Production manager may come up through the ranks, in which case college degree may be unnecessary though desirable.

Work Activities: Efficiency expert seeks efficient ways of handling materials and manufacturing products; does time-and-motion studies to determine most efficient sequence of movements, tries to make it possible for worker to turn out more work in given period of time. May also study nature and workings of organization; suggest improvements; explain needed changes to management.

Industrial engineer determines best way to use manpower, machines, materials. Designs research on problems of organization, production, etc. May design systems for data processing, management control systems, systems for distribution of goods and services. May advise on such problems as plant location.

Production manager likely to be a vice-president of company; deals with problems of production, supervises routine processes of production as well as dealing with special problems. Entrance often through job of management trainee.

Outcomes: Efficiently working organizations; production of cheaper or better services or products.

Supervision; Social Relations: Supervised by superior in firm where employed.

Salary; Other Benefits: Salary dependent on place of employment but usually high. See section on Business Manager, p. 82.

Role of Sexes: Mainly men's fields.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (69th percentile) in physical science, engineering and math; lowest (40th percentile) in hunting and fishing, skilled trades, farming, and labor.

Information

General: Average around 68th percentile on information scores; highest (74th percentile) in mathematics; lowest (63rd percentile) in biological science.

Specific: 64th percentile in engineering, and accounting, business and sales.

Similar to: Manufacturing management

Abilities

General: Around the 67th percentile in ability scores; highest (74th percentile) in introductory math; high (69th percentile) in English and arithmetic reasoning; lowest (61st percentile) in three-dimensional visualization.

Similar to: Manufacturing management

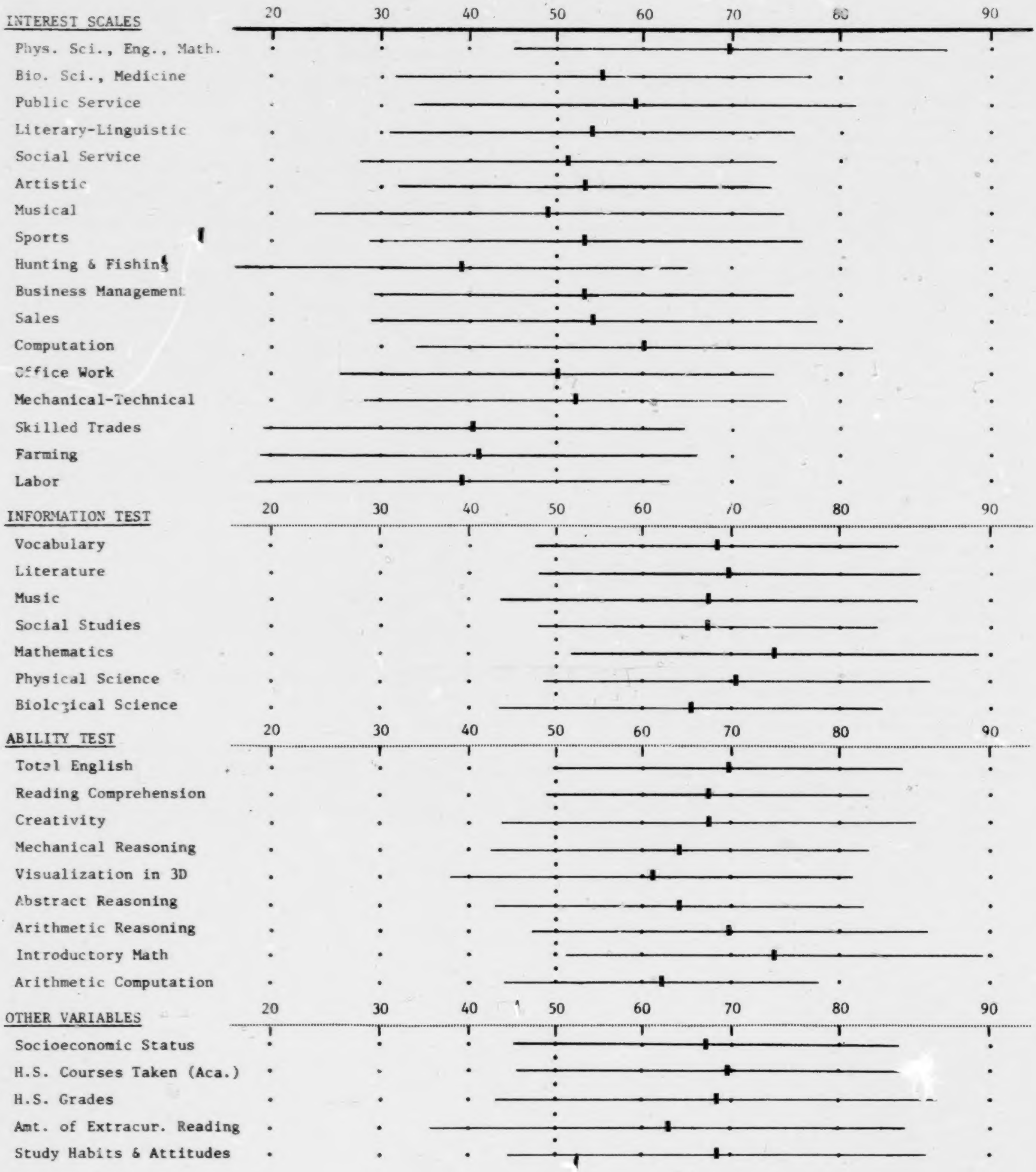
Others

General: High (69th percentile) in academic orientation of high school courses; low (63rd percentile) in extracurricular reading.

Specific: 56th percentile in social sensitivity.

EFFICIENCY EXPERT, INDUSTRIAL ENGINEER, PRODUCTION MANAGER (not elsewhere classified)

(Male - n = 341)



FINANCE WORKER

Importance: Our increasingly complex financial system requires a large number of workers at the administrative and professional levels.

Training: Finance workers may become officers by being promoted from below, in which case a degree is not necessary. Most bank officers chosen in this way. Officer-training programs put on by institution. Officer trainees hired from outside are usually expected to have a degree, preferably from a school of business administration with a major in finance, or in liberal arts with a major related to business, economics, etc. Trainees from outside the organization receive in-service training after they are hired.

Work Activities: Finance workers work for financial institutions such as banks, savings and loan companies, and consumer credit organizations. They provide financial services, including credit, to the public. Some sell stocks and bonds. Others are accountants, auditors, and business research analysts. Those in Career Group 3 are finance workers at the administrative level.

Banks are the most common financial institutions. They take care of checking and savings accounts, lend money, and sometimes provide services such as credit cards, travellers' checks, etc. Some manage trusts by which money is left for specific purposes.

A great deal of a bank's work consists of record-keeping, much of which is done by clerks, tellers, and computers, but about a fifth of the workers in a bank are bank officers. Bank officers usually include the president, vice presidents who act as heads of departments, and a comptroller or cashier responsible for bank property. There may also be a treasurer and additional officers and assistant officers. A bank officer is a decision-maker who works within the policy set by the bank's directors. He may decide on loans, evaluate credit, administer trusts, invest trust funds, and give business advice to clients.

Some bank officers are loan officers, who must understand economics, production, and merchandising, as well as local economic circumstances. Others are trust officers, which involves knowledge of investment, taxes, and property management. The operations officer runs the bank and trains and supervises its personnel. There are also correspondent bank officers, who communicate with other banks, international officers who deal with clients abroad, and branch bank managers.

Outcomes: Dependable and profitable financial services, smoothly running financial organization.

Supervision; Social Relations: Supervised by person above him in organization.

Salary; Other Benefits: In 1969 new college-graduate executive trainees in large banks, insurance companies, and similar institutions earned about $580-$750 a month. Salaries of senior bank officers several times this; usually larger in larger cities.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (56th percentile) in business management, sales, computation, office work, and musical; lowest (39th percentile) in natural sciences, sports, and hunting and fishing.

Information

General: Average around 51st percentile; high (53rd percentile) in mathematics and music; low (42nd percentile) in vocabulary and biological sciences.

Specific: 56th percentile in accounting, business and sales.

Abilities

General: Around 52nd percentile on ability scores; high (55th percentile) in English, arithmetic and mathematics, and creativity; low (45th percentile) in mechanical and abstract reasoning.

Specific: Very high (70th percentile) in table reading.

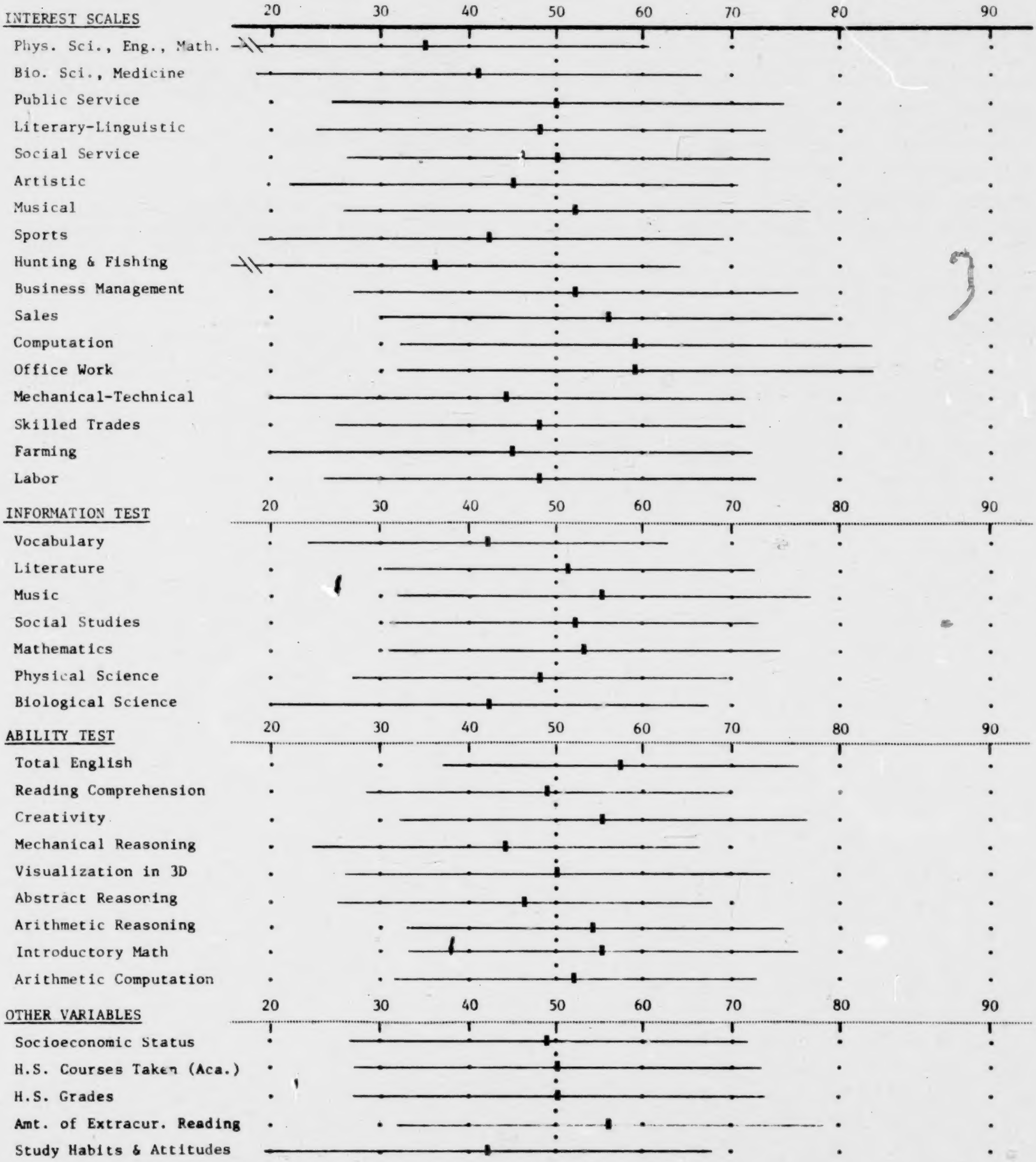
Others

General: High (56th percentile) in extracurricular reading; low (42nd percentile) in study habits and attitudes.

Specific: High (58th percentile) in sociability.

FINANCE WORKER

(Male - n = 178)



INDUSTRY, BUSINESS, COMMERCE (not elsewhere classified)

Importance: Includes all administrative business workers except those already discussed under Career Group 3. May be proprietors, vice presidents, marketing research workers, public relations men, etc.

Training: Usually no specific amount of formal education required, but general equivalent of a college education usually necessary.

Work Activities: Determined by nature of job.

Outcomes: Dependent on nature of job.

Supervision; Social Relations: Dependent on nature of job.

Salary; Other Benefits: Dependent on nature of job. Usually moderately high or high.

Role of Sexes: Varies according to nature of job but men predominate.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (55th percentile) in public service, business management and sales; low (45th percentile) in hunting and fishing, mechanical-technical, skilled trades, farming, sports, and labor.

Information

General: Average around 55th percentile on information scores; highest (61st percentile) in literature; lowest (51st percentile) in vocabulary, and biological science.

Specific: 59th percentile in accounting, business, and sales.

Abilities

General: Around the 53rd percentile on ability scores; highest (59th percentile) in arithmetic reasoning, and introductory mathematics; low (48th percentile) in mechanical reasoning, three-dimensional visualization, and arithmetic computation.

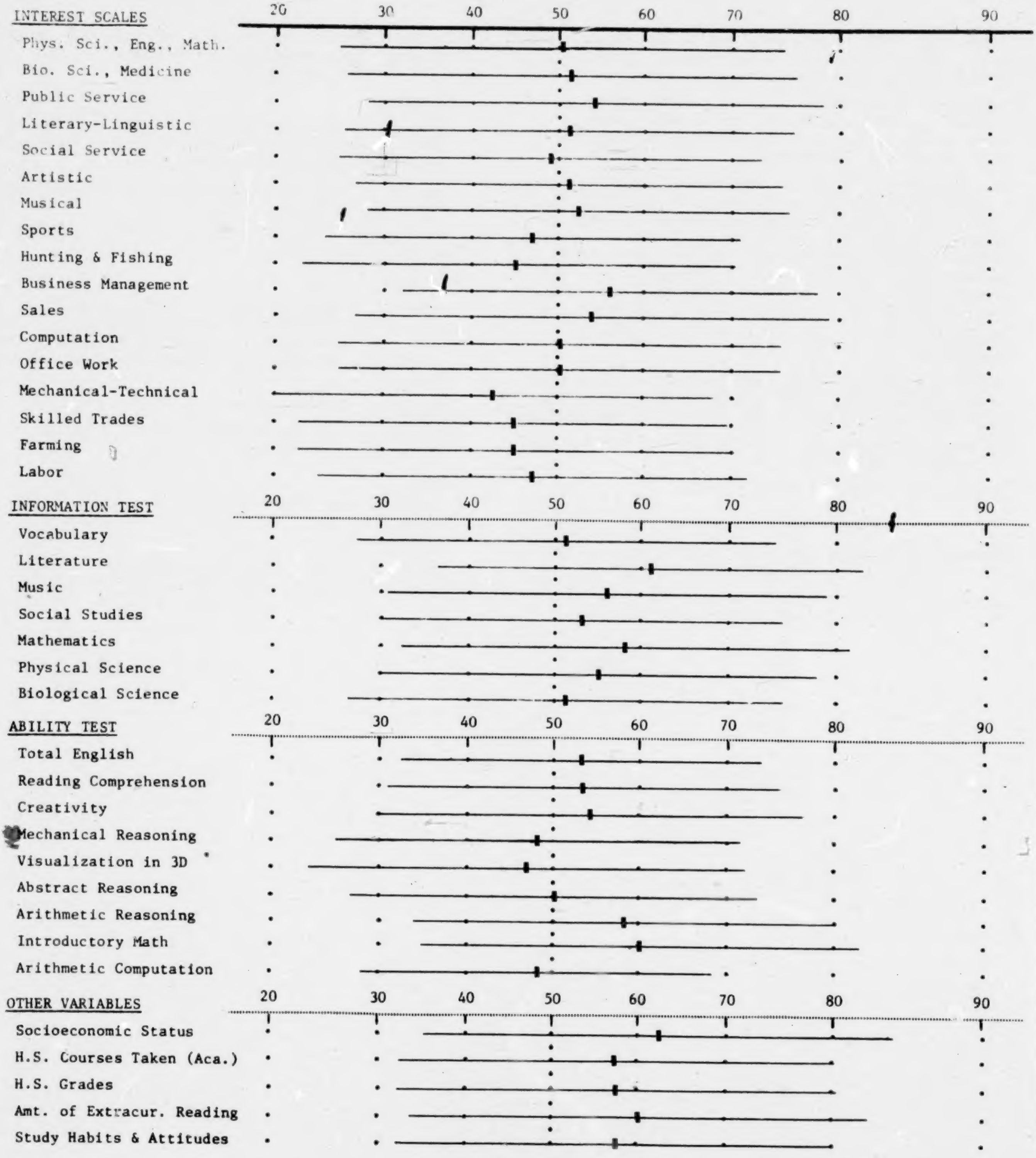
Others

General: High (62nd percentile) in socioeconomic status; low (57th percentile) in academic orientation of courses, high school grades, and study habits and attitudes.

Specific: High (55th percentile) in social sensitivity; 53rd percentile in sociability, and self-perception of reading skills.

INDUSTRY, BUSINESS, COMMERCE (not elsewhere classified)

(Male - n = 400)



INVESTMENT CONSULTANT

Importance: Many investments made by persons or institutions who are unable to judge worth of various stocks, securities, etc.

Training: Should have college degree or equivalent; business training desirable. Chief requirement knowledge of financial field and value or potential value of various investments.

Work Activities: Analyzes information regarding investment program of public, industrial, and financial institutions and of individuals, interprets data concerning possible investments and predicts their future value. Studies financial publications, securities manuals, etc. for information; summarizes data. May analyze losses and unfavorable financial trends and suggest remedies. May relay orders to broker.

Outcomes: Correct and useful advice on potential investments.

Supervision; Social Relations: Supervised by superior in own organization; some self-employed. Indirectly supervised by person, firm for whom he is consulting.

Salary; Other Benefits: Vary with nature and location of employer; usually high.

Role of Sexes: Mainly a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Relatively high scores (60th percentile) in public service, business management, literary-linguistic, sales, computation, and natural sciences; quite low (29th percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around 76th percentile; highest (81st percentile) in mathematics; lowest (62nd percentile) in biological science.

Specific: Very high (82nd percentile) in accounting, business, and sales.

Similar to: Military officer except for presence of artistic information.

Abilities

General: Around the 72nd percentile in ability scores; highest (79th percentile) in English, arithmetic and mathematics; lowest (55th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 74th percentile in table reading.

Similar to: Military officer but at level of 5 percentile ranks lower.

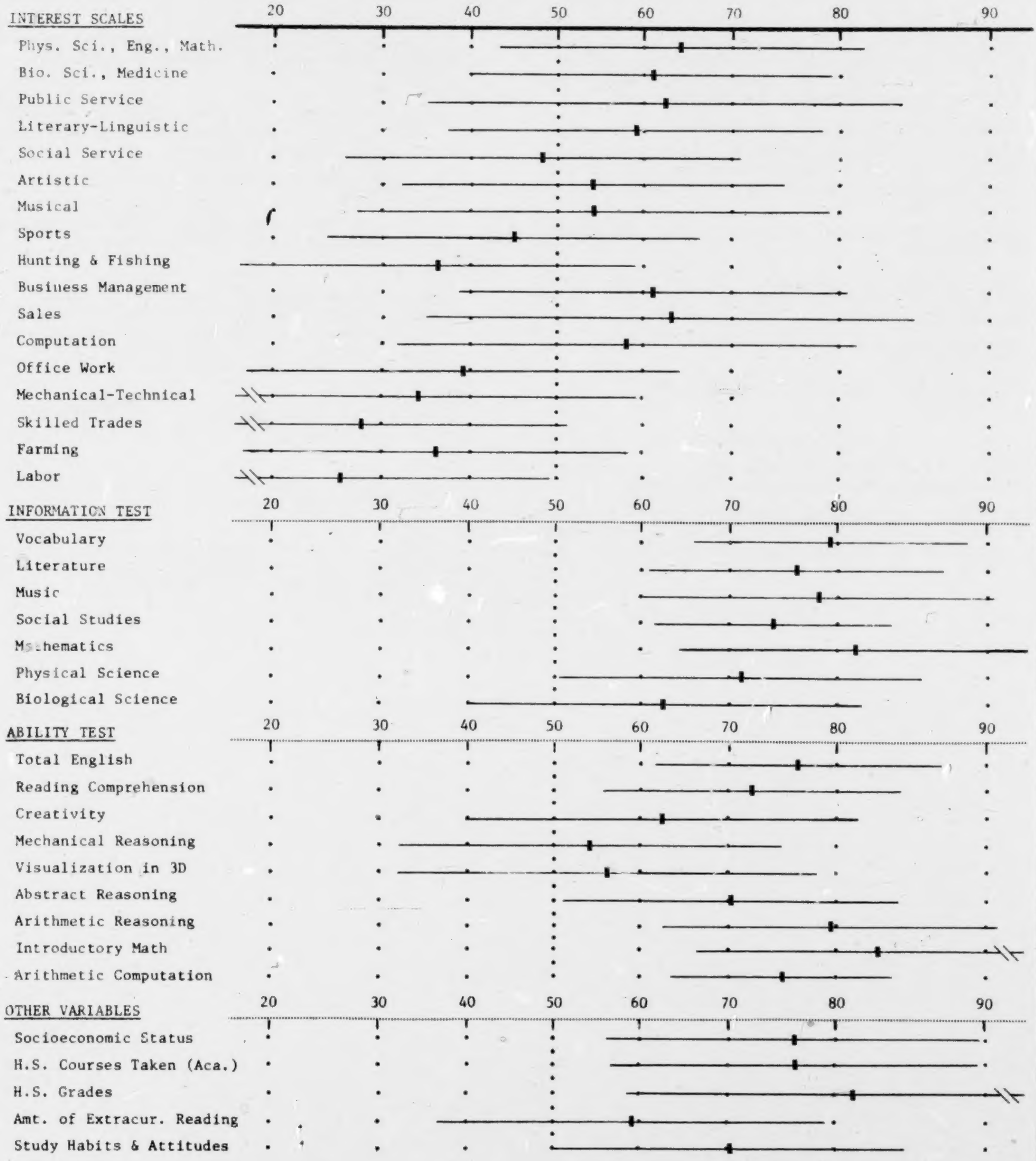
Others

General: High (81st percentile) in high school grades; low (59th percentile) in extracurricular reading.

Specific: 67th percentile in sociability, social sensitivity, and self-perception of reading skills.

INVESTMENT CONSULTANT

(Male - n = 42)



MANUFACTURING MANAGEMENT

Importance: Our way of life depends on the manufacture of great quantities of goods. Manufacturing manager oversees their production. Large firms depend increasingly on trained management specialists.

Training: See section on Business Manager, p. 82.

Work Activities: Oversees manufacturing process, checks on efficiency, devises new plans, sees that deadlines are met. Assists in estimating need for men and materials.

Outcomes: Economically manufactured articles salable at a profit.

Supervision; Social Relations: Supervised by superior in plant's organization. Good social relations upward and downward necessary.

Salary; Other Benefits: See section on Business Manager, p. 82.

Role of Sexes: Largely a man's field; 85% of all managers men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (60th percentile) in natural sciences; lowest (42nd percentile) in skilled trades, farming, labor, and hunting and fishing.

Similar to: Efficiency expert, industrial engineer, production manager (not elsewhere classified).

Information

General: Average around 68th percentile; highest (72nd percentile) in mathematics; lowest (63rd percentile) in biological science.

Specific: 69th percentile in accounting, business and sales.

Similar to: Efficiency expert, industrial engineer, production manager (not elsewhere classified).

Abilities

General: Around the 67th percentile on ability scores; highest (71st percentile) in English, arithmetic reasoning, and introductory mathematics; lowest (60th percentile) in abstract reasoning, three-dimensional visualization, and arithmetic computation.

Similar to: Efficiency expert, industrial engineer, production manager (not elsewhere classified).

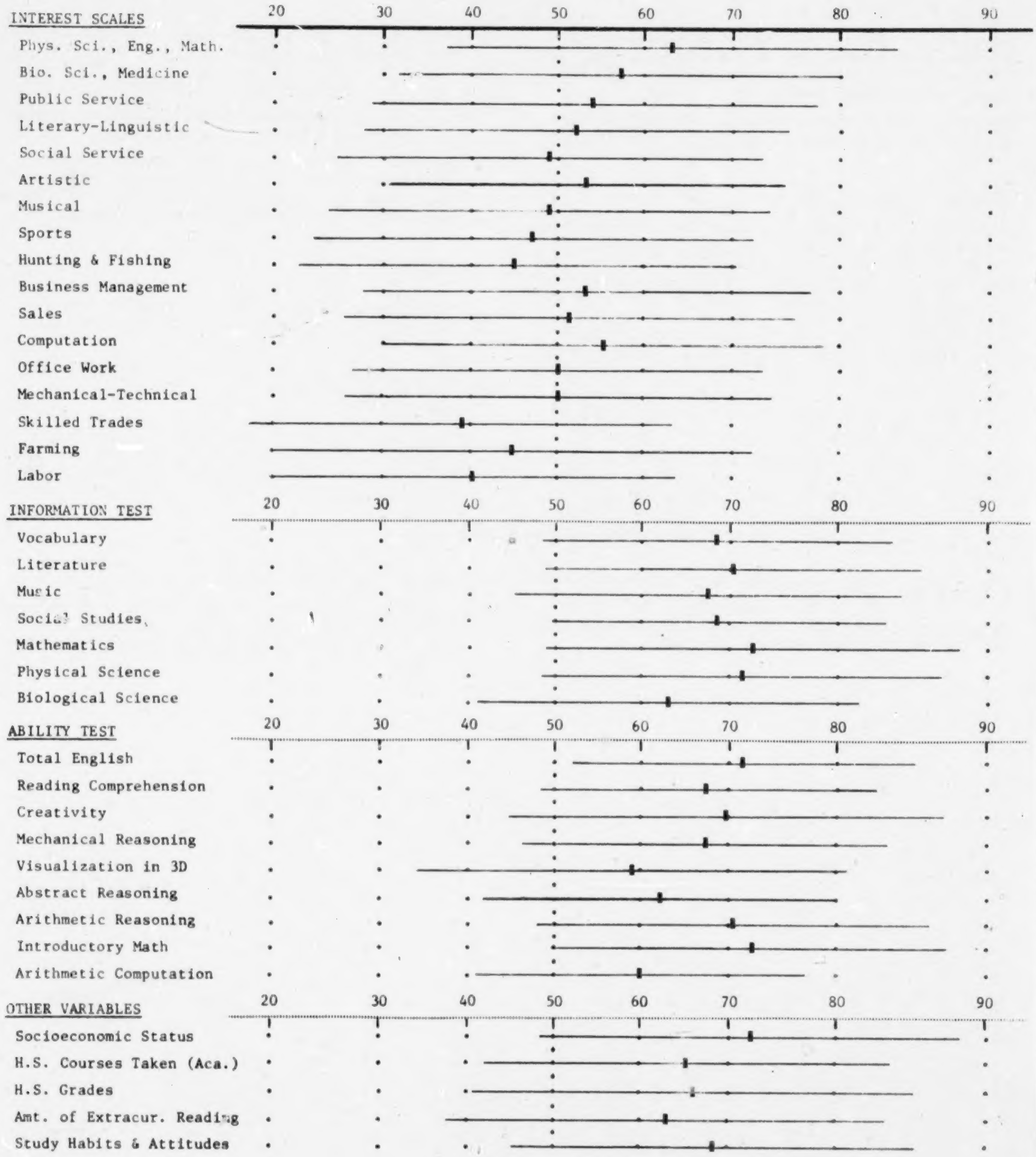
Others

General: High (72nd percentile) in socioeconomic status; low (63rd percentile) in extracurricular reading.

Specific: High (65th percentile) in self-confidence. 60th percentile in sociability, social sensitivity, and self-perception of reading skills.

MANUFACTURING MANAGEMENT

(Male - n = 235)



MARKETING and WHOLESALE, RETAIL TRADE MANAGER

Importance: Sees to distribution of manufactured articles from manufacturer to ultimate customer. In 1970, nearly 1/3 of all salaried managers worked in retail and wholesale trade.

Training: See section on Business Manager, p. 82, and (for Marketing Manager) section on Sales Manager, p. 218.

Work Activities: For marketing manager, see section on Sales Manager, p. 218.

Wholesaler buys merchandise and sells it to retailers or consumers. Purchases estimated amounts needed by his firm. Directs assembly of goods in large lots and distribution in smaller ones. Supervises salesmen and men granting credit; advises customers. Retailer sells goods directly to consumer, through stores, catalogs, or salesmen. Chief retail establishments are department stores, food stores, restaurants. Retail trade manager may manage entire store or some one aspect of its activities.

Managers, officials, and proprietors made up 21% of the personnel in wholesale and retail trade in 1970.

Outcomes: For sales manager, sale of product to wholesaler, retailer, or consumer. For wholesale trade manager, distribution of goods from manufacturer to retailer or large-scale consumer; for retail trade manager, distribution of goods from wholesaler to consumer.

Supervision; Social Relations: Supervised by superior in organization; sometimes self-employed.

Salary; Other Benefits: See section on Business Manager, p. 82, and Sales Manager, p. 218.

Role of Sexes: 85% of all managers men; 1/3 of all women managers are in retail field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (57th percentile) in business management, sales, computation, and office work; lowest (41st percentile) in hunting and fishing, mechanical-technical, skilled trades, farming, and labor.

Information

General: Average around 63rd percentile on information scores; highest (68th percentile) in mathematics; lowest (55th percentile) in biological science.

Specific: High (67th percentile) in accounting, business and sales.

Abilities

General: Around the 59th percentile on ability scores; highest (64th percentile) in English, arithmetic, and mathematics; lowest (52nd percentile) in mechanical reasoning, and three-dimensional visualization.

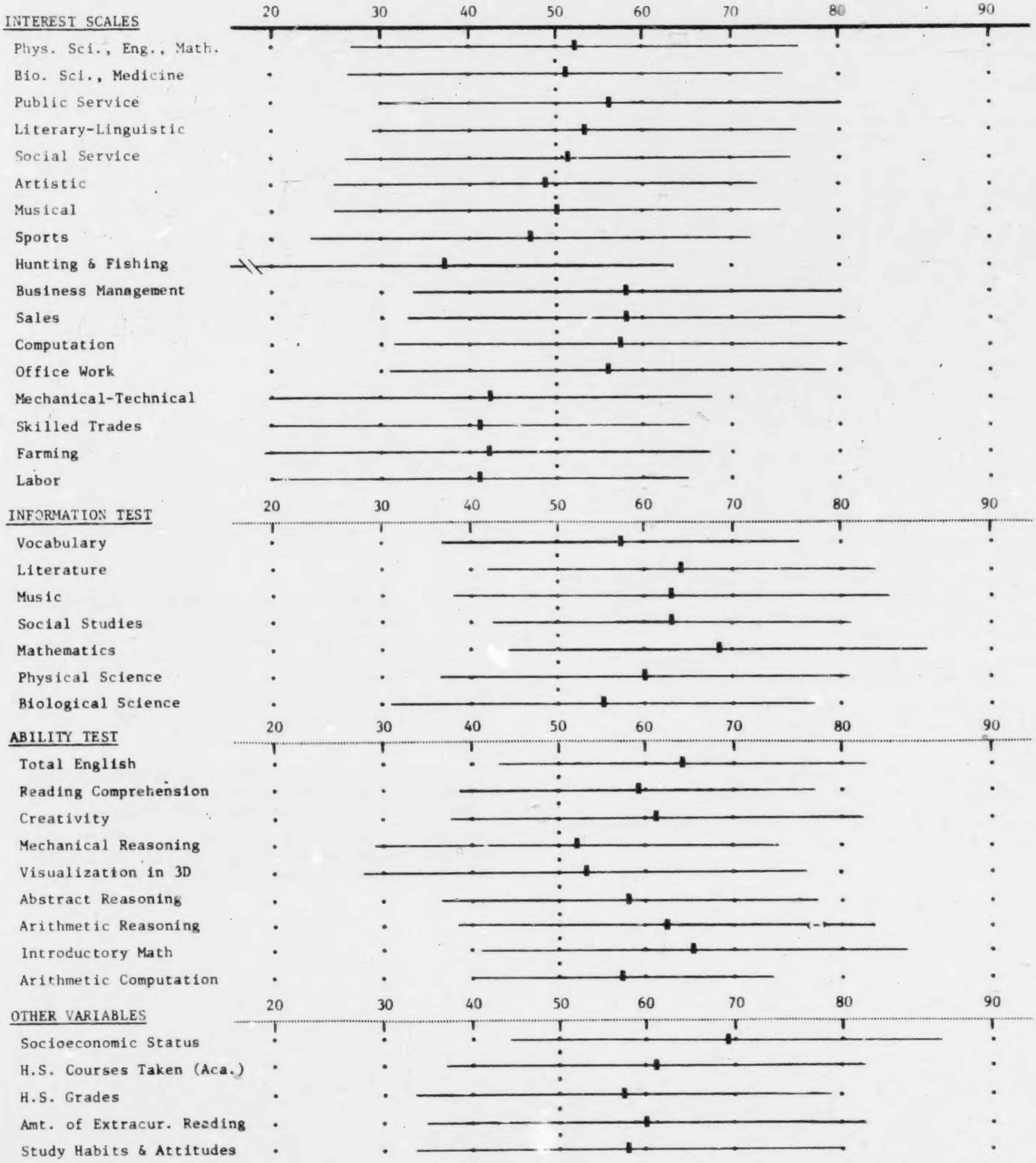
Others

General: High (69th percentile) in socioeconomic status; low (57th percentile) in high school grades.

Specific: High (59th percentile) in self-confidence; 58th percentile in sociability, and social sensitivity; 55th percentile in self-perception of reading skills.

MARKETING and WHOLESALE, RETAIL TRADE MANAGER

(Male - n = 571)



MILITARY OFFICER

Importance: Military services responsible for the nation's safety from outside attack and domestic insurrection.

Training: Officers usually, but not necessarily, college graduates. Some officers receive military training at government expense while in college. Others become officers after outstanding service in enlisted ranks, or other indications of ability, result in their being sent to officers' training school or, in wartime, given battlefield commissions. Some officers given direct commissions without any military training because they have some specialty, such as medicine or dentistry, that the services need. Such officers usually given a small amount of military training after they are commissioned.

Work Activities: An officer carries out the commands, or performs the duties, ordered by those above him in the chain of command. Except in the case of specialist officers, these duties usually performed by supervision of officers, enlisted personnel, and civilians working under him. Continuous training carried on in the military services, both for combat and for the maintenance services of the forces.

Outcomes: The outcome of the military officer's work is the successful completion of duties imposed on him by his superiors and the efficiency, morale, and well-being of the persons under his command.

Supervision; Social Relations: Officer directly supervised by the person immediately above him in the chain of command, and indirectly supervised by all officers of rank higher than his own. He in turn directly supervises the persons under him, and indirectly all persons of lesser rank.

Salary and Other Benefits: In 1973, salaries for commissioned officers in the Army are as follows:

Second Lieutenant	$ 536 per month
First Lieutenant	652 per month
Captain	748 per month
Major	805 per month
Lt. Colonel	954 per month
Colonel	1194 per month

Comparable ranks in the other services earn comparable salaries. Military officer's main rewards, however, are in fringe benefits and retirement. Many things such as medical care for himself and family provided free. Other things such as food, drink, and lodging provided at only nominal cost. Retirement is permitted after twenty years of work or the development of lasting illness or disability.

Role of Sexes: All branches of the United States military service have women's components in which women may serve as military officers. Military nurse corps recently opened to men as well as to women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (69th percentile) in natural sciences; lowest (39th percentile) in sales, skilled trades, and labor.

Information

General: Average around 78th percentile on information scores; highest (83rd percentile) in mathematics; lowest (74th percentile) in biological science.

Specific: Highest (79th percentile) in military information; high (76th percentile) in aerospace; 71st percentile in accounting, business and sales.

Similar to: Similar to investment consultant except for lack of artistic information.

Abilities

General: Around the 74th percentile on ability scores; highest in English, creativity, and arithmetic and mathematics; lowest (71st percentile) in abstract and mechanical reasoning, and three-dimensional visualization.

Similar to: Investment consultant but at level of 5 percentile ranks higher.

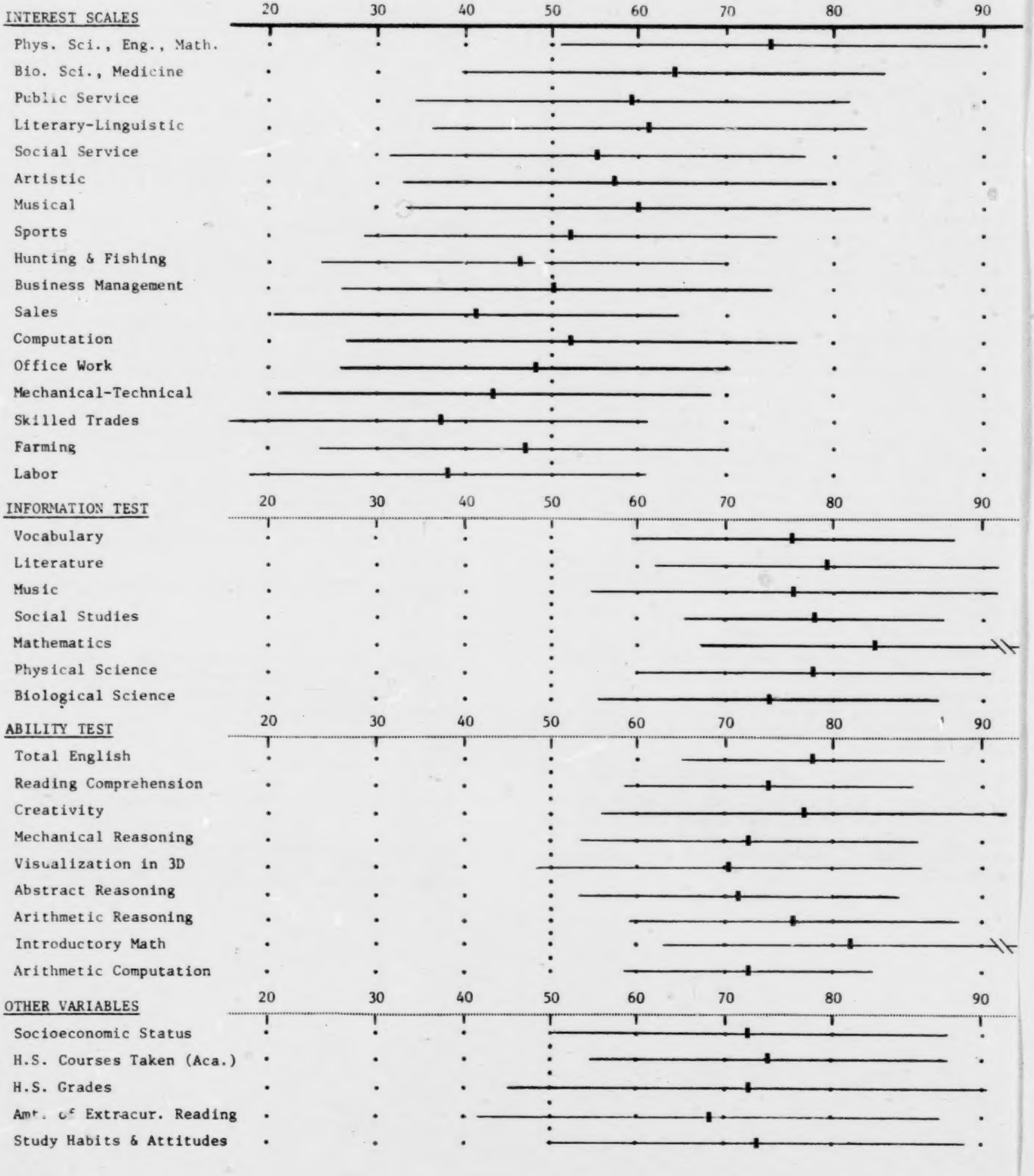
Others

General: High (74th percentile) in academic course orientation, and study habits and attitudes; low (68th percentile) in extracurricular reading.

Specific: High (68th percentile) in self-confidence, and self-perception of reading skills; 59th percentile in sociability, and social sensitivity.

MILITARY OFFICER

(Male - n = 295)



PERSONNEL ADMINISTRATION

Importance: Most workers now in large organizations; head of organization can no longer know them individually. Personnel administrator trained to choose and retain type of personnel needed.

Training: Some personnel workers enter the personnel field by being promoted or transferred from other jobs within the organization. These need not necessarily have college degrees. Others start out as personnel workers, and for them a bachelor's degree is desirable, with a major in personnel administration, business administration, or some field such as engineering which is related to the purpose of the organization. College training is then supplemented by on-the-job training in the personnel department. In addition to their formal training, personnel workers need to be naturally good at dealing with people and at handling detailed work.

Work Activities: Personnel workers interview, hire, and assign new employees, classify jobs, counsel workers, plan pay scales and training programs, and administer benefit plans. Some devise and administer tests for prospective employees. The personnel worker sometimes deals with disciplinary problems; he interprets the company's policy to the worker and helps find solutions when friction exists. Just as the purchasing agent sees that his organization has the supplies, materials, and equipment that it needs, so the personnel worker sees that it has the people it needs.

In a large organization the personnel worker is part of a department headed by a personnel director and may specialize in some particular aspect of personnel administration. In a very small one he may combine other duties with personnel work.

In 1970 private firms employed over half of all personnel workers. Many also worked for government organizations; nearly all business and government organizations have personnel workers. A few personnel workers form their own organizations as consultants or personnel experts.

Outcomes: An efficient and contented labor force.

Supervision; Social Relations: Supervised by person directly above him in personnel department or in organization. Ability to converse understandingly with employees, union representatives, job applicants, etc., essential.

Salary; Other Benefits: In 1970 personnel workers in private industry started at about $9,000 and job analysts with experience earned about $13,000. Personnel directors' salaries generally ranged between $12,500 and $22,000.

Personnel workers in federal service started at $6,548 or $8,098; with master's degrees and high class rank they might start at $9,881. With administrative jobs and several years of experience they earned over $16,500, and personnel directors for important departments earned over $22,500.

Usually good employee benefits.

Role of Sexes: Less than one-fourth of all personnel workers are women. Women personnel workers tend to be concentrated in organizations with many women workers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (59th percentile) in biological science, public service, and business management; lowest (37th percentile) in hunting and fishing, mechanical-technical, skilled trades, farming and labor.

Information

General: Average around 67th percentile on information scores; highest (71st percentile) in mathematics; lowest (57th percentile) in biological science.

Specific: 67th percentile in accounting, business and sales.

Abilities

General: Around the 65th percentile on ability scores; highest (72nd percentile) in English; lowest (55th percentile) in mechanical reasoning, and three-dimensional visualization.

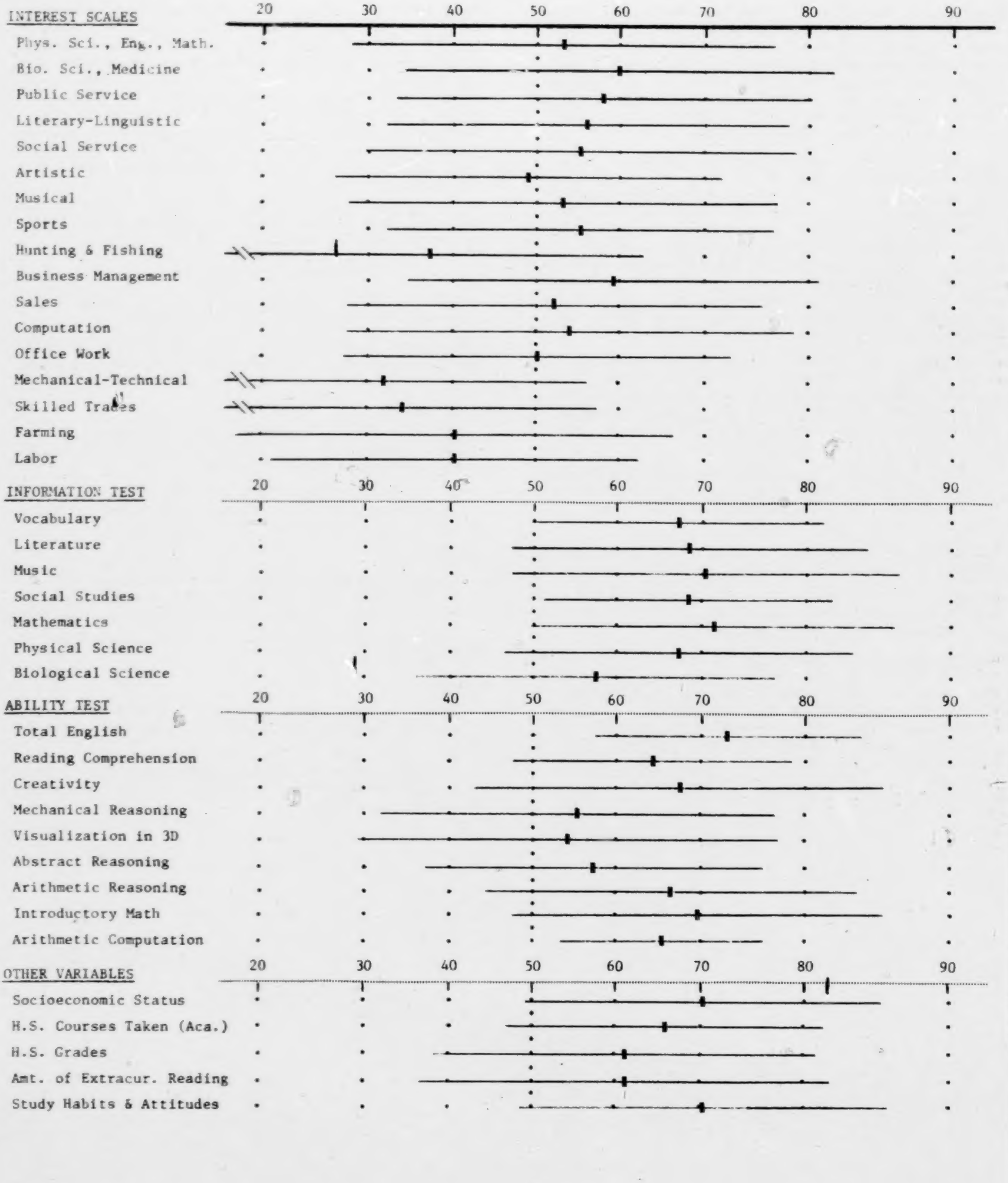
Others

General: High (70th percentile) in socio-economic status, and study habits and attitudes; low (61st percentile) in high school grades and extracurricular reading.

Specific: High (66th percentile) in sociability; 64th percentile in social sensitivity; 60th percentile in maturity, and self-perception of reading skills.

PERSONNEL ADMINISTRATION

(Male - n = 259)



PILOT

Importance: Aviation of great importance both in warfare and in the peacetime economy. Air travel now the standard means of long-distance travel, both within the nation and between nations and continents. Each plane under the command of the pilot, as an ocean-going vessel is under the command of its captain. Responsible for the supervision and safety of the aircraft, its passengers, and other members of the crew.

Training: Aviation education more important for a pilot than academic education. Many pilots trained in the military services. Others graduate from private flying schools or get on-the-job training. Must be licensed by the Federal Aviation Administration, after physical testing and written and practical tests of aviation skills. Continue to take tests from time to time throughout period of service as pilots. Requirements vary according to the kind of plane pilot is to be flying. Most pilots serve as copilot for a time before they become pilots.

Work Activities: Pilot's duties include preflight and postflight as well as flight activities. Must check weather conditions, prepare flight plan and get it approved, plot plane's course and compute flying time. Before flight checks condition of the plane to make sure that all parts are functioning.

In flight supervises navigation and, with the help of copilot, maintains contact with ground operations and checks plane's functioning and rate of progress. Records of flight must be filed when trip is over.

Pilots of small planes may also do repair and maintenance work on the planes they are flying.

Outcomes: The desired outcome for a pilot is the safe and punctual arrival of his flight at its destination with adherence to flight regulations.

Supervision; Social Relations: A pilot is supervised both by the person or, more commonly, the organization that owns the plane he is flying, and by government through its examinations and regulations. The pilot in turn supervises other members of the plane's crew. A military pilot is usually of officer rank. Some pilots, such as the bush pilots of Alaska, are self-employed.

Salary; Other Benefits: Military pilots receive pay according to their rank plus flight pay. Civilian pilots' pay varies according to the kind of flying they are doing and the organization for which they are working. In 1970 pilots on scheduled airlines earned about $30,000 a year for flying within the United States, or $37,000 a year for international flying. Working hours are shorter than for most other occupations. Financial danger of a pilot's occupation is that failure of a physical or other examination can terminate his employment.

Role of Sexes: A very few women work as pilots, mainly for small air services or as independents, but field is predominantly masculine.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (60th percentile) in natural sciences; lowest (39th percentile) in sales, skilled trades, and labor.

Information

General: Average around the 69th percentile on information scores; high (73rd percentile) in mathematics; low (67th percentile) in music.

Specific: Very high (77th percentile) in aerospace, and electricity and electronics; 67th percentile in mechanics; 72nd percentile in military.

Abilities

General: Around the 68th percentile on ability scores; high (73rd percentile) in mechanical reasoning; low (58th percentile) in arithmetic computation.

Specific: 71st percentile in advanced math, and table reading.

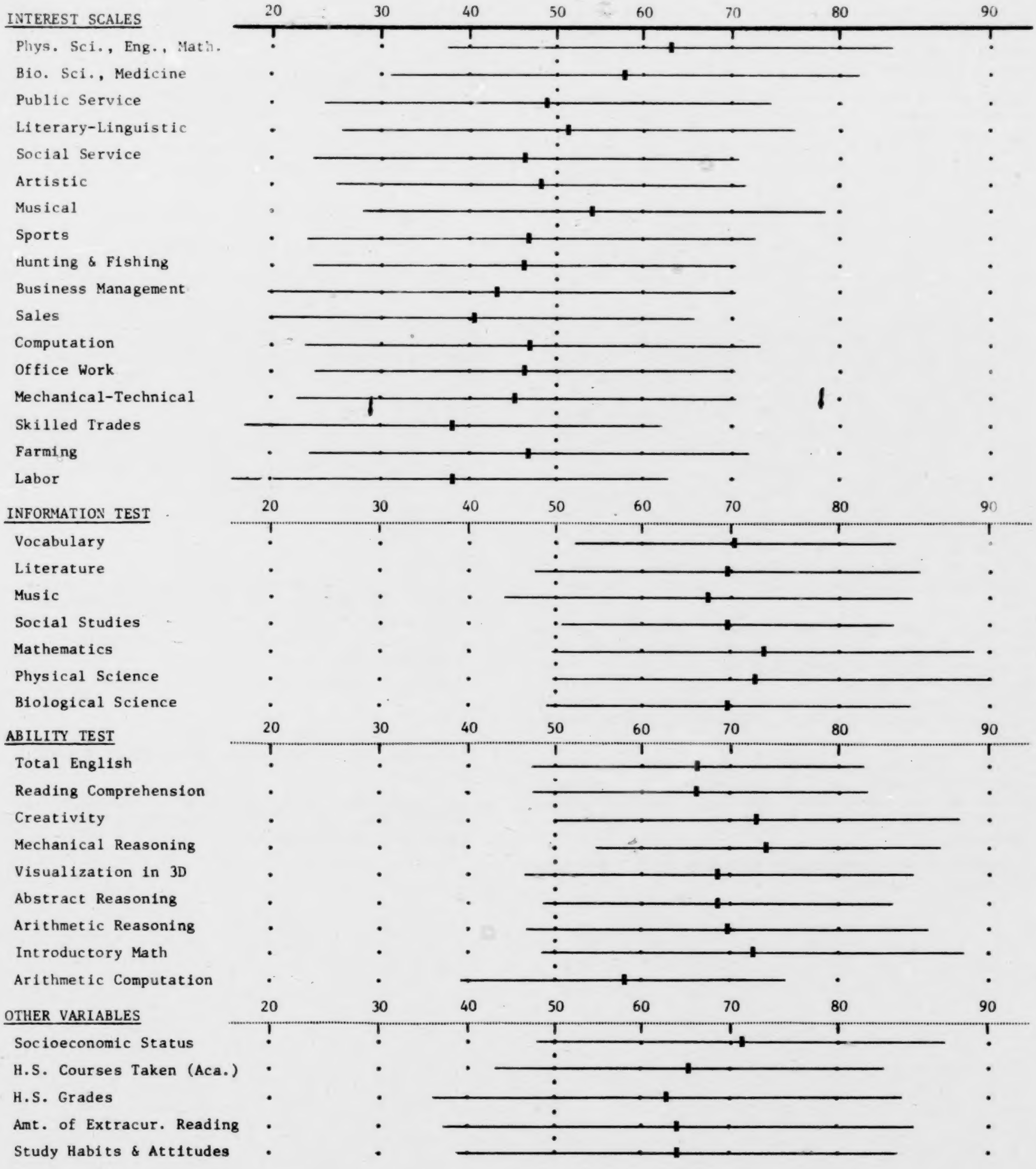
Others

General: High (71st percentile) in socioeconomic status; low (63rd percentile) in high school grades.

Specific: High (62nd percentile) in maturity, and self-perception of reading skills; 52nd percentile in sociability; 54th percentile in social sensitivity, and self-confidence.

PILOT

(Male - n = 440)



PURCHASING AGENT

Importance: Purchasing important for manufacturing firms because it provides the materials they need to work on; for all firms as a means of acquiring necessary supplies and equipment.

Training: Purchasing agent may be hired from outside or may be promoted from within the organization--some employers prefer this because the purchasing agent is then familiar with the company's needs. Purchasing agent who has been promoted from within the organization may or may not have a college degree. If hired from outside many employers want him to have a degree in business administration or engineering, with courses in accounting, economics, and purchasing. In-service training usually required before the employee does actual purchasing. For high-level positions helpful to have a graduate degree.

Work Activities: Purchasing agent buys the materials, supplies, and equipment needed by his company as economically as possible and sees that adequate stores are always available. If he works for an industry he also buys the raw materials needed in manufacturing, and the machines which process them. In large firms, purchasing agents may specialize, each buying a certain class of the needed materials, supplies, or equipment.

Purchasing agent must be familiar with the various sources from which needed things can be bought, and be able to compare quality and price intelligently. Must keep up with new products and new sources of supply. Must know the rate at which supplies and materials are used so as to keep adequate amounts on hand. Sometimes has to deal with unexpected emergency requisitions.

Purchasing agent talks with salesmen, consults catalogs, compares prices, sometimes gets bids from various suppliers. Examines specifications and exercises quality control on the materials, supplies, and equipment bought. Must know the needs of his particular company, office, or institution so that he can be sure of meeting them.

In 1970, half the purchasing agents and similar buyers worked in manufacturing. Others employed by government offices and by wholesalers, retailers, and institutions. Usually purchasing department contains less than ten employees.

Outcomes: Needed supplies of suitable quality purchased at reasonable rates.

Supervision; Social Relations: Supervised by superior in organization. Good relations with suppliers essential.

Salary; Other Benefits: In 1970, male college graduates started at $6,300-$9,500 in industry, or at $6,548 or $8,093 in government. Experienced buyers in private firms usually earned over $9,000, and more experienced buyers nearly $14,000. Some high-level purchasing agents earned up to $75,000 a year. Usual fringe benefits.

Role of Sexes: About 90% of purchasing agents men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (60th percentile) in business management, sales, computation, and office work; lowest (45th percentile) in literary-linguistic, artistic, musical, sports, and hunting and fishing.

Information

General: Average around 54th percentile on information scores; highest (61st percentile) in literature, and mathematics; lowest (48th percentile) in vocabulary, and biological science.

Specific: 56th percentile in accounting, business and sales.

Abilities

General: Around the 55th percentile on ability scores; highest (61st percentile) in English, and introductory mathematics; lowest (50th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 67th percentile in table reading.

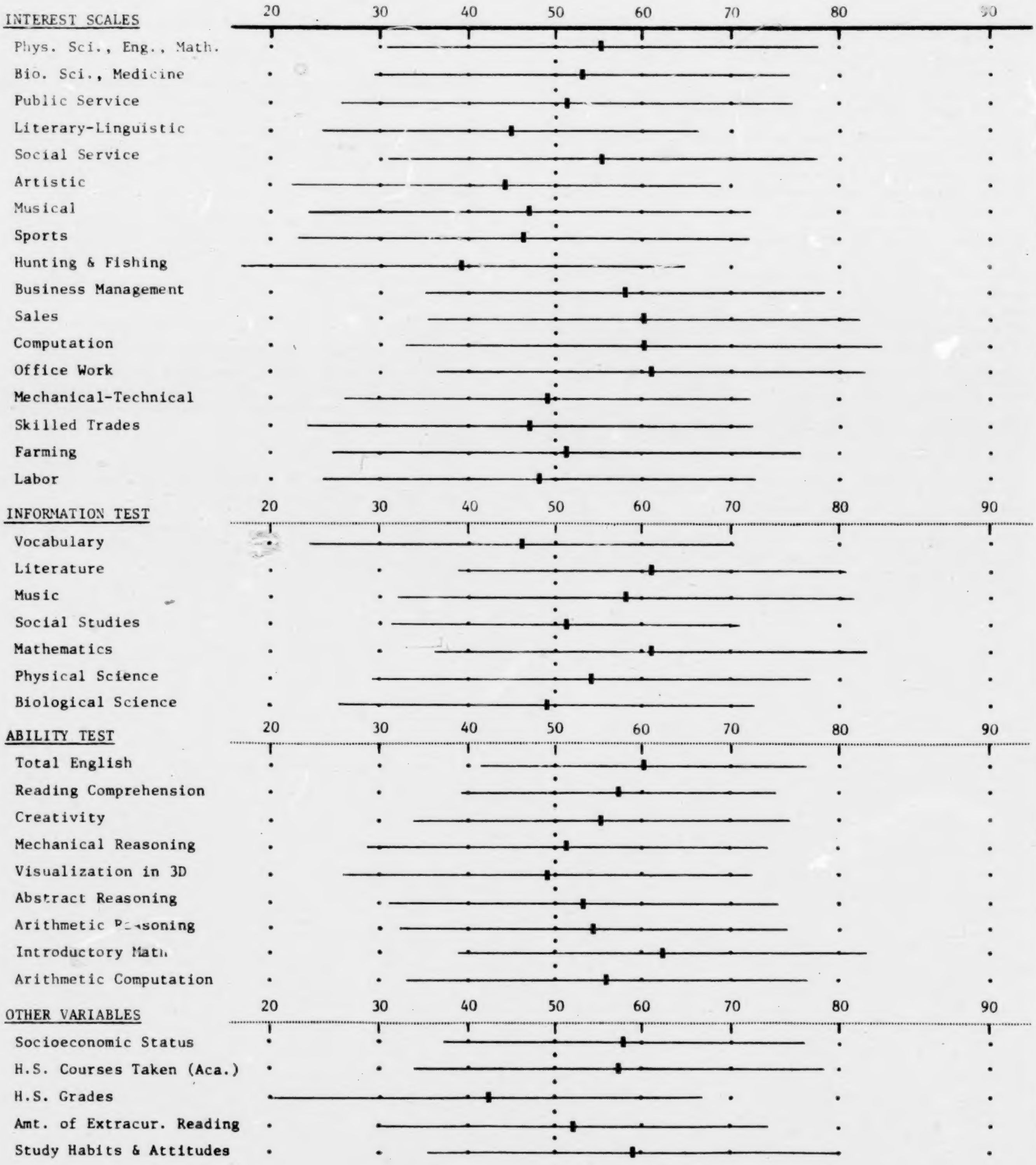
Others

General: High (59th percentile) in study habits and attitudes; low (42nd percentile) in high school grades.

Specific: High (60th percentile) in social sensitivity; 52nd percentile in sociability, and self-perception of reading skills.

PURCHASING AGENT

(Male - n = 103)



RETAIL BUYER

Importance: Store exists primarily to sell merchandise, but first it has to buy merchandise to sell. If it buys merchandise that does not sell well, or that is of poor quality, or that costs too much, it loses money or customers. Success in selling depends in large part on the buyer who chooses the merchandise.

Training: No special amount of formal education necessary for a retail store buyer. Most needed is knowledge of the products he will be buying, their price and places where they can be bought, and people's tastes and preferences in regard to them.

Work Activities: Buyer checks on what his store is likely to need in the way of additional merchandise. Consults manufacturers and suppliers to obtain the best quality of merchandise that he can for price range he has in mind. Must pay attention not only to the quality of the merchandise but to the tastes, fads, and fancies of the public.

Outcomes: Acquisition of merchandise that will sell well at good profit and satisfy customer.

Supervision; Social Relations: Supervised by the store manager and, in large stores, by the head of the department for which he is buying. Should maintain good relations not only with them but with clerks, who can often tell him a good deal about customers' preferences and reasons for buying or not buying.

Salary; Other Benefits: Usually depends on the size of the store as well as on the buyer's experience and ability. Buying in some departments requires more skill and knowledge than in others.

Role of Sexes: Both men and women employed as buyers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (62nd percentile) in physical science, public service, and artistic; lowest (31st percentile) in social service, and office work.

Information

General: Average around 69th percentile on information scores; highest (72nd percentile) in mathematics; lowest (62nd percentile) in biological science.

Specific: 68th percentile in accounting, business and sales.

Abilities

General: Around the 66th percentile on ability scores; highest (72nd percentile) in creativity, mechanical reasoning, and introductory mathematics; lowest (58th percentile) in arithmetic computation.

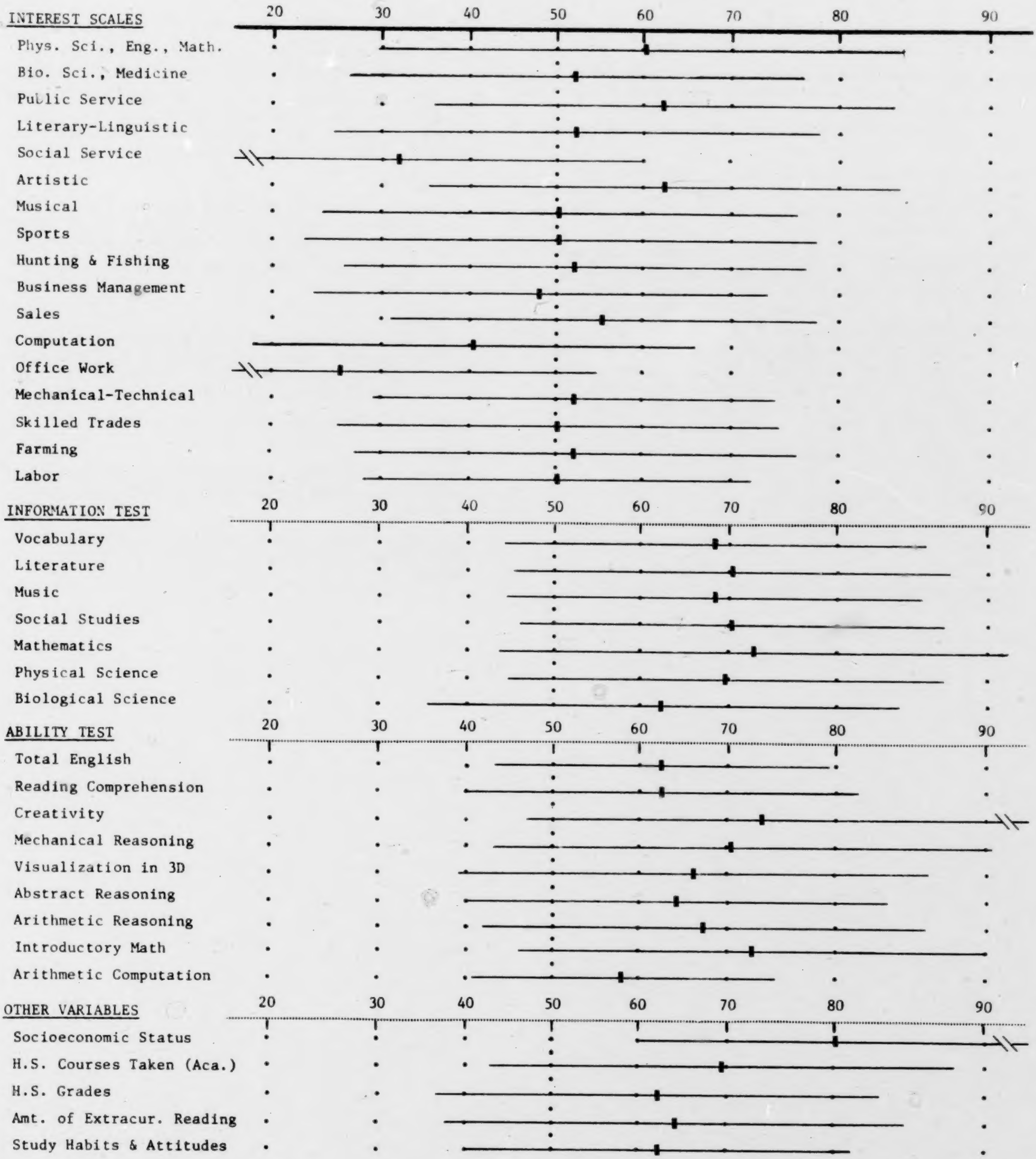
Others

General: High (80th percentile) in socioeconomic status; low (62nd percentile) in high school grades, and study habits and attitudes.

Specific: 30th percentile in sociability; 41st percentile in social sensitivity; 51st percentile in self-perception of reading skills.

RETAIL BUYER

(Female - n = 87)



STOCKBROKER

Importance: Enables institutions and individuals to profit from shares in the national economy.

Training: Usually no formal educational requirements but college education or equivalent important. Courses in business administration, economics, finance desirable. Likeable personality and social training necessary.

On-the-job training usually given. Securities and Exchange Commission examination required for securities salesmen, also state licensing in most states. May have to be bonded.

Work Activities: Acts as an agent in the buying and selling of stocks and other securities. Deals in or executes orders to buy or sell securities. Since rates for these services are standard the field is highly competitive.

Has both individuals and institutions (pension funds, etc.) as customers. May specialize in certain kinds of investors or certain kinds of securities. Must know characteristics of various securities to match them to needs of customers.

New accounts often acquired through social contact or connections.

Outcomes: Sale of securities.

Supervision; Social Relations: Supervised by superior in organization. Social contacts with customers important.

Salary; Other Benefits: Dependent on amount of business.

Role of Sexes: Mainly a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (69th percentile and above) in public service, literary-linguistic, and business management; lowest (33rd percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around 70th percentile on information scores; highest (75th percentile) in literature; lowest (58th percentile) in biological science.

Specific: 70th percentile in accounting, business and sales.

Abilities

General: Around the 66th percentile on ability scores; highest (69th percentile) in English, reading comprehension, and introductory mathematics; lowest (50th percentile) in mechanical reasoning.

Specific: Table reading at 75th percentile.

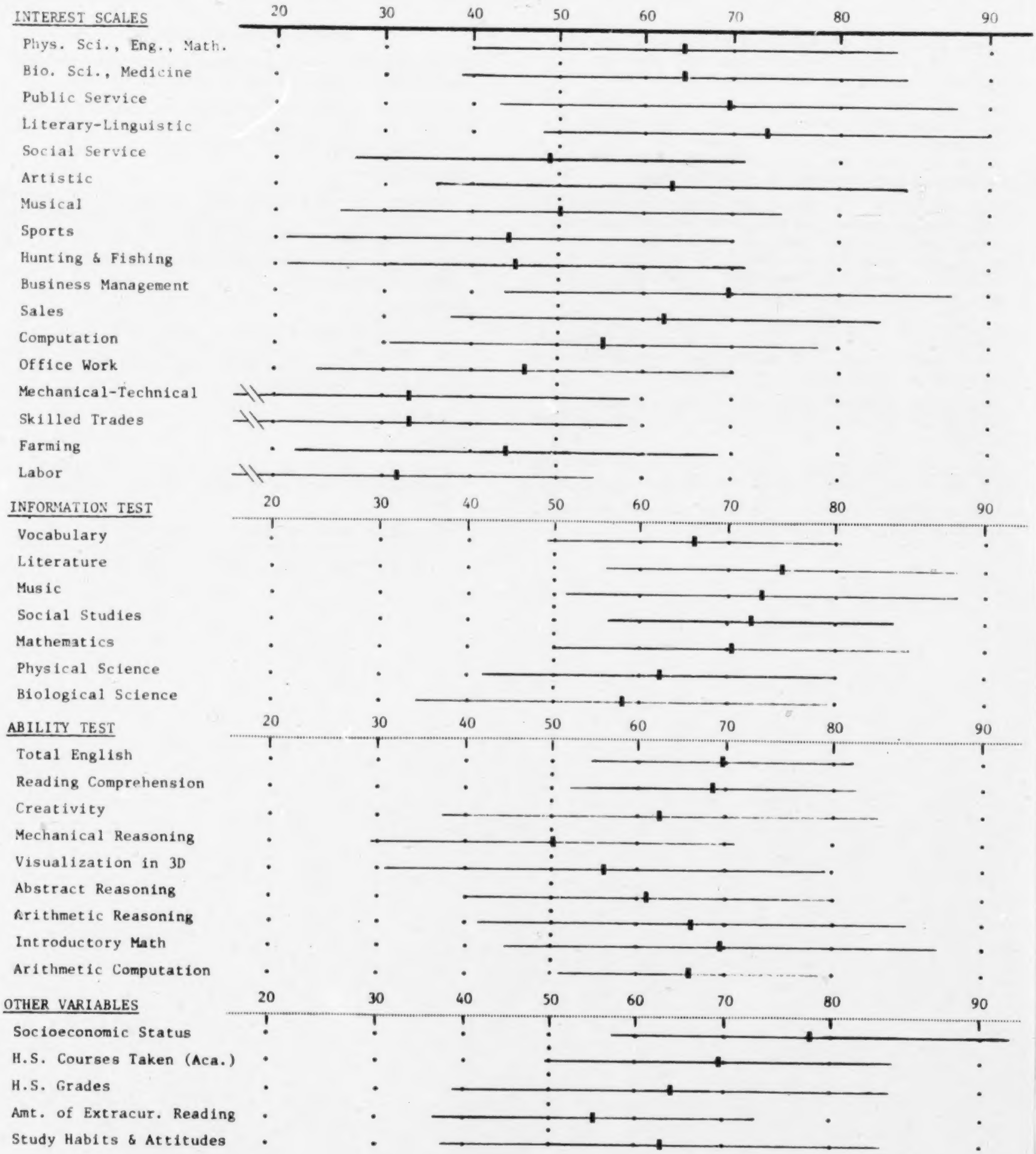
Others

General: High (78th percentile) in socioeconomic status; low (55th percentile) in extracurricular reading.

Specific: High (70th percentile) in sociability; 68th percentile in self-perception of reading skills.

STOCKBROKER

(Male - n = 69)



TEACHER - Commercial Education

Importance: All students need to learn to handle their own personal finances; some will work in the business and economic institutions of our society.

Training: The educational requirements for high-school commercial teachers are about the same as for secondary-school teachers in general (see p. 126), except that they must include training in commercial subjects and the methods of teaching them.

Work Activities: A high-school commercial teacher instructs commercial students in bookkeeping, typing, stenography, business methods, and business arithmetic. He may also instruct non-commercial students in such subjects as business arithmetic, making out tax forms, and handling their personal finances.

Outcomes: The education of commercial students so that they can earn a living in the world of business, and of ordinary students so that they can handle their personal business affairs efficiently.

Supervision; Social Relations: These are about the same as for secondary-school teachers in general (see p. 126).

Salary; Other Benefits: These are about the same as for secondary-school teachers in general (see p. 126).

Role of Sexes: Both men and women work as teachers of high-school commercial education.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (67th percentile) in computation, and office work; lowest (49th percentile) in biological sciences, and artistic.

Information

General: Average around 63rd percentile on information scores; high (73rd percentile) in mathematics; low (60th percentile) in biological science.

Specific: High (68th percentile) in accounting, business and sales.

Abilities

General: Around the 63rd percentile on ability scores; high (71st percentile) in arithmetic reasoning, and introductory math; low (59th percentile) in arithmetic computation.

Specific: 63rd percentile in memory for words.

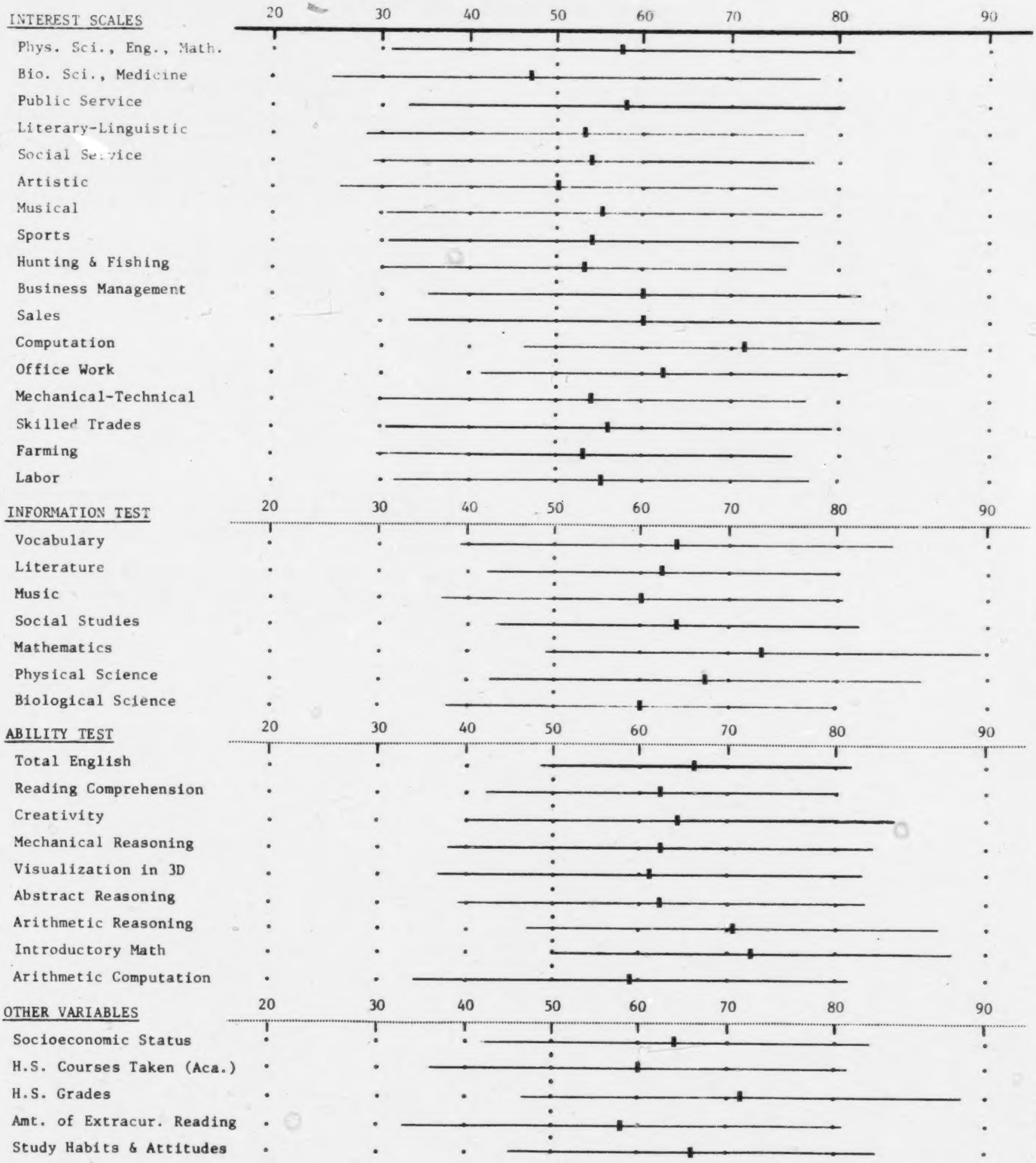
Others

General: High (71st percentile) in high school grades; low (58th percentile) in extracurricular reading.

Specific: 48th percentile in sociability, and self-perception of reading skills; 55th percentile in social sensitivity, and self-confidence.

TEACHER - Commercial Education

(Female - n = 173)



CHAPTER 6

CAREER GROUP 4

General Teaching and Social Services

In Career Group 4 we have included jobs that are related to teaching or to helping people solve their problems. The jobs in this Career Group are:

- Clergyman (A)
- Guidance
  - Counseling (Females) (b)
  - Vocational/Educational (Females) (d)
- Social Worker (Females) (e)
- Teacher (not elsewhere classified) (Females) (f)
  - Elementary (Females) (g)
  - High School (Females) (h)
  - Preschool (Females) (i)
  - Specialists
    - Handicapped (Females) (j)
    - Home Economics (Females) (k)
    - Physical Education (Females) (l)

All of these workers have chosen occupations in which they have the opportunity to help other people. Teachers help students learn about academic subjects and about themselves. Social workers and clergymen help people to solve problems or adjust to crises in their lives.

Nearly all of the occupations in Career Group 4 require at least four years of study at a college or university.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest scores (65th percentile) in natural sciences, public service, and literary-linguistic; low (27th percentile) in office work.

Information

General: Average around 72nd percentile on information scores; highest (80th percentile) in mathematics; lowest (67th percentile) in biological science.

Specific: 60th percentile in health.

Abilities

General: Around the 67th percentile on ability scores; highest (77th percentile) in introductory math; lowest (60th percentile) in arithmetic computation. Most occupations in this Career Group need some ability in arithmetic computation.

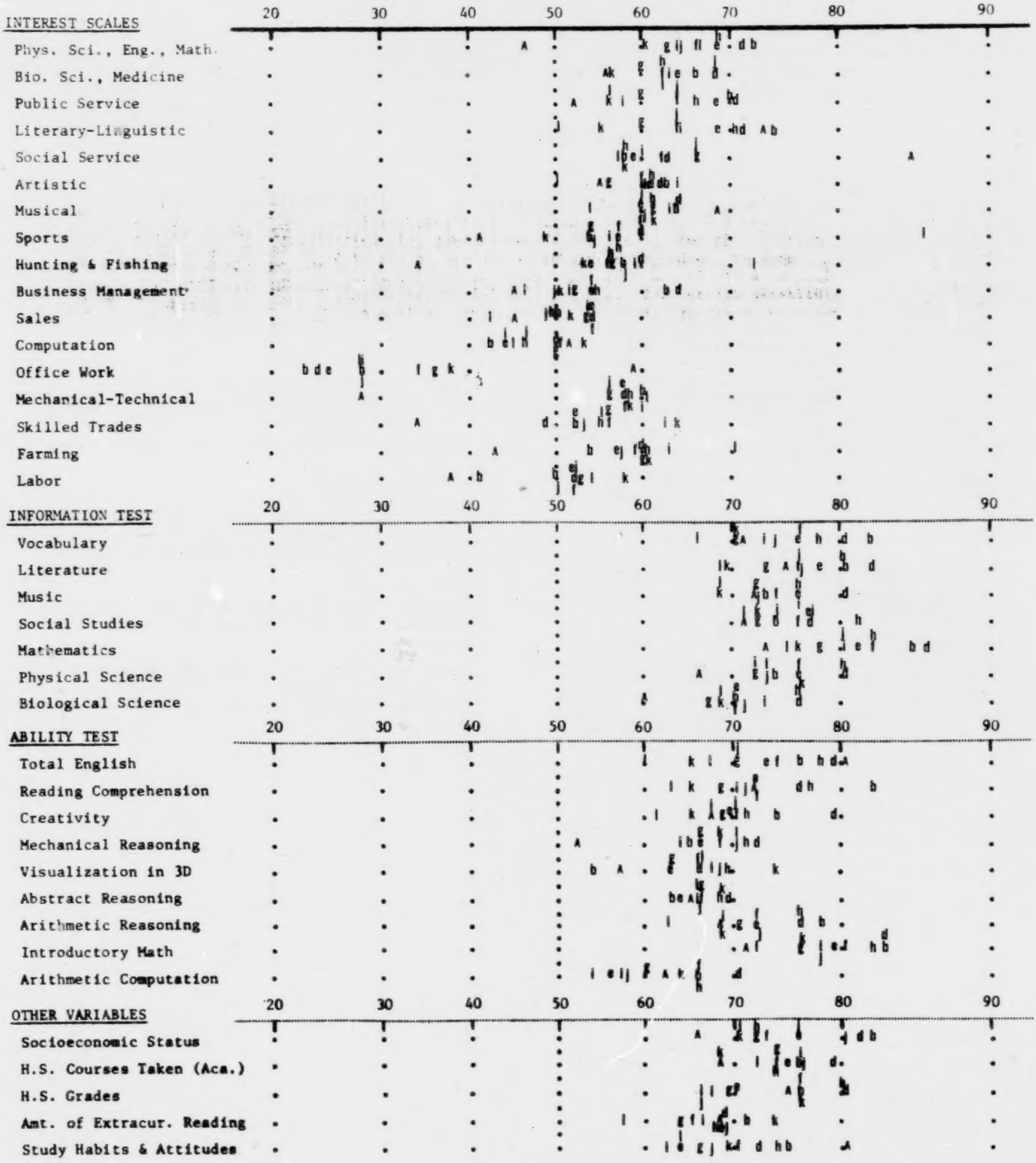
Others

General: High (75th percentile) in socioeconomic status and academic orientation of high school courses; low (65th percentile) in extracurricular reading.

Specific: 50th percentile in sociability; 57th percentile in social sensitivity; 61st percentile in self-confidence, and self-perception of reading skills.

CAREER GROUP 4

General Teaching and Social Services



CLERGYMAN

Importance: Ministers, priests, and rabbis, assisted by nuns, deaconesses, etc., care for the religious and emotional needs of religious congregations. For many people they are the most readily available source of advice and help.

Training: Educational requirements for being ordained as priest, rabbi, or minister vary according to the denomination. Some require no formal education whatever; the Roman Catholic Church requires eight years of study beyond high school. A large number require college graduation plus three years' additional training in a theological seminary. Educational requirements for nuns, etc. vary according to religious group concerned.

Work Activities: A clergyman gives sermons, supervises religious education, conducts youth groups, counsels and advises members of his congregation, and administers the finances of his installation. Many engage in social work, political activity, and efforts at social improvement. Some act as missionaries, chaplains, and teachers. Younger clergymen often assistants to older clergymen. Nuns, deaconesses, etc. teach, work as nurses, staff charitable institutions.

Outcomes: Increased religious feeling and concern for welfare of others on part of congregation, comfort and assistance to the troubled and sick, influence on public affairs.

Supervision; Social Relations: Some clergymen directly supervised by congregations but most by officials above them in the religious organization. All indirectly supervised by congregations.

Salary; Other Benefits: Salary varies according to religious group; some clergymen unpaid; others (usually in cities or prosperous suburbs) earn high salaries. Working hours vary but clergyman usually not held to daily routine. Most religious groups offer fringe benefits such as pensions, low tuition for children, etc.

Role of Sexes: Women not ordained in Roman Catholic, Jewish, or some Protestant religions; fewer than 5% of Protestant ministers women. But women often employed as clergyman's assistants, editors, directors of religious education, etc. Movement now under way for ordaining women as ministers in additional churches. Many women serve as nuns or deaconesses in Roman Catholic and some other religious groups.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (85th percentile) in social service; high (71st percentile) in literary-linguistic, and musical; lowest (32nd percentile) in hunting and fishing, mechanical-technical, and skilled trades.

Information

General: Average around 71st percentile on information scores; highest (75th percentile) in literature; lowest (60th percentile) in biological sciences.

Specific: Extremely high (86th percentile) in Bible.

Abilities

General: Around the 67th percentile in ability scores; high (74th percentile) in English, reading, and mathematics; low (55th percentile) in mechanical reasoning, and three-dimensional visualization.

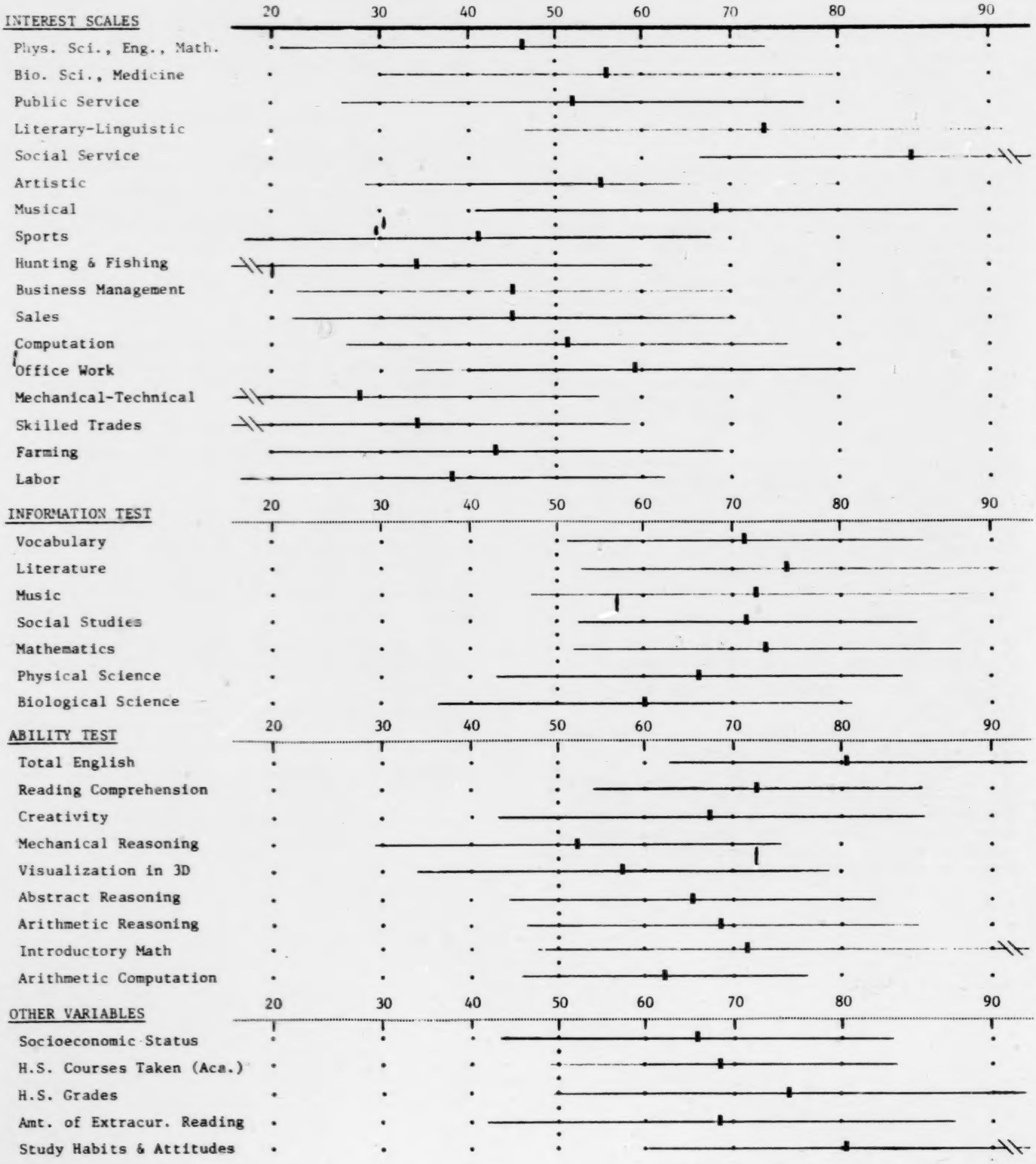
Others

General: High (80th percentile) in study habits and attitudes; low (66th percentile) in socioeconomic status.

Specific: High (68th percentile) in maturity; 52nd percentile in sociability; 63rd percentile in social sensitivity, self-confidence, and self-perception of reading skills.

CLERGYMAN

(Male - n = 508)



GUIDANCE COUNSELING

Importance: Gathering of students into large schools lessens teacher acquaintance with background of child; professional counselor helps bridge gap between school and child's out-of-school environment. Juvenile delinquency, drug problem, have made behavior problems a matter of concern. Counseling believed useful in improving school performance of disadvantaged children.

Training: In most states counselors need both counseling and teaching certificates. For counselor's certificate need graduate standing and 1-5 years of teaching experience. Teacher education plus courses in psychology and sociology recommended. In some states where teaching experience not required counselor can take liberal arts program. Some states substitute counseling internship for teaching experience or allow counseling under supervision while taking courses. Counselor education programs usually given in departments of education or psychology.

Work Activities: School counselors often combine personal guidance with educational and vocational guidance. (See section on Vocational and Educational Guidance, p. 118.)

School counselor works with both students and faculty; also with parents and community agencies. Talks to students, gathers information about them from school and other sources, gives tests. Counsels on career fitness and educational opportunities and on personal and social problems. With grade school children, observes play, consults about child with parents, teachers, school psychologist, school social worker.

May teach classes, conduct clubs, etc.

Guidance counselors may also work for social agencies, youth organizations, prisons, reformatories, etc.

Outcomes: Better individual adjustment to life in and out of school.

Supervision; Social Relations: Supervised by head of department or by superior in organization.

Salary; Other Benefits: In 1969-70 school counselors with bachelor's degree averaged $7,300 to $10,300, with master's degree $8,300 to $12,400, with doctorate up to $18,700. Salaries often higher than those of classroom teachers. Usually get regular salary increments; some do part-time outside work. Salaries of counselors in private schools, private industry, and private charity vary widely.

Role of Sexes: Both men and women work as guidance counselors.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (70th percentile) in natural sciences, public service, and literary-linguistic; low (42nd percentile) in computation, and labor; lowest (26th percentile) in office work.

Similar to: Guidance/Educational-Vocational (Females) and Social Worker.

Information

General: Average around 75th percentile on information scores; highest (83rd percentile) in vocabulary, literature, and mathematics; lowest (70th percentile) in biological science.

Specific: High (76th percentile) in law.

Similar to: Guidance/Educational-Vocational (Females)

Abilities

General: Around the 74th percentile in abilities; high (83rd percentile) in reading comprehension, and mathematics; lowest (54th percentile) in three-dimensional visualization.

Similar to: Guidance/Educational-Vocational (Females)

Others

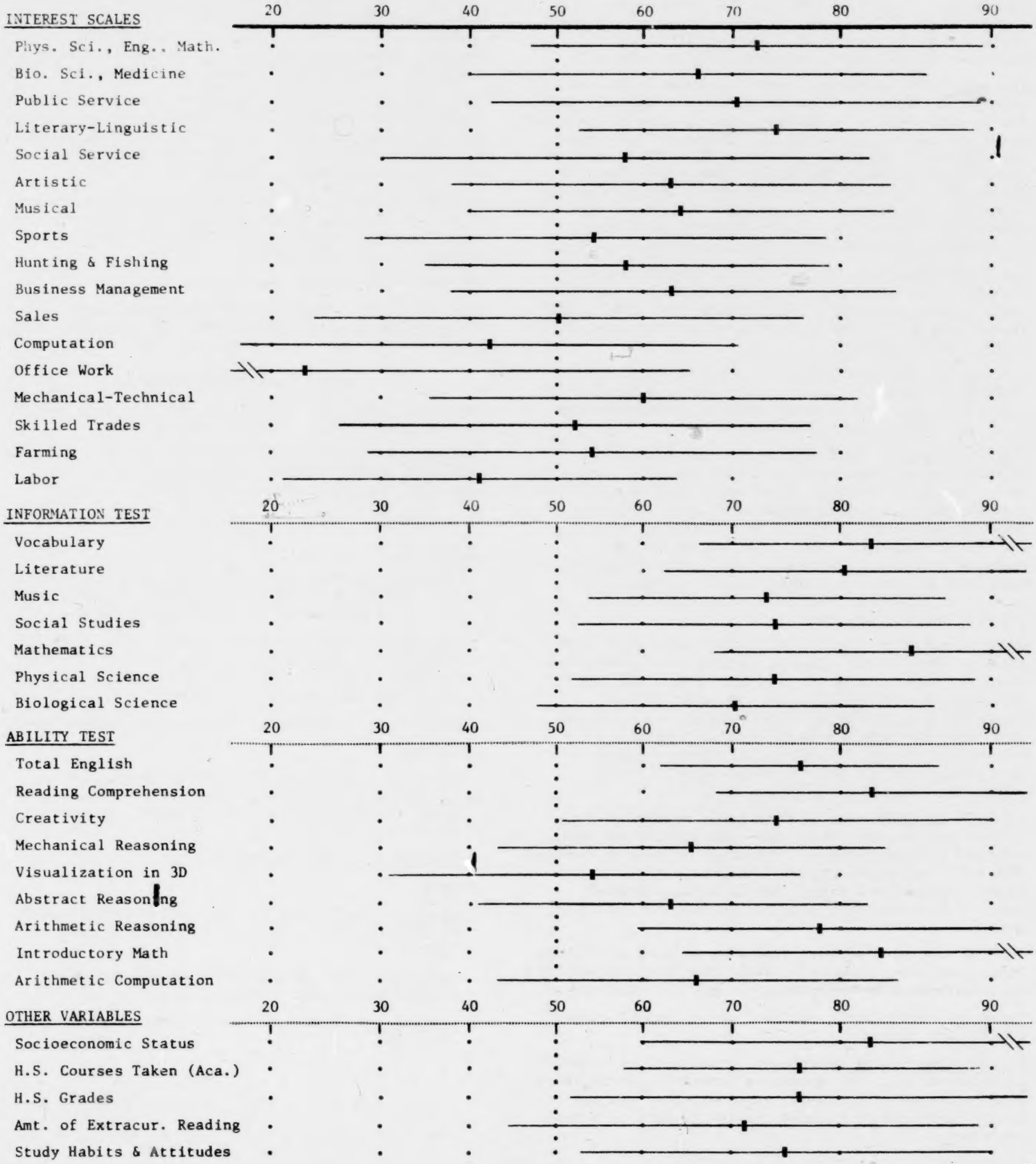
General: High (82nd percentile) in socioeconomic status; low (71st percentile) in extracurricular reading.

Specific: 58th percentile in sociability, social sensitivity, and self-confidence; 67th percentile in maturity, and self-perception of reading skills.

Similar to: Guidance/Educational-Vocational (Females) and Social Worker (Females).

GUIDANCE COUNSELING

(Female - n = 60)



GUIDANCE - Vocational, Educational

Importance: Much time lost through wrong choice of occupation or curriculum. Proper guidance can prevent wrong choice in many cases, thus contributing to happiness of individual and prosperity of community.

Training: For employment counselor trainee in state employment office, minimum is bachelor's degree, preferably with major in a social science, plus 15 semester hours in counseling and related courses. For employment counselor, master's degree or 30 hours in counseling related courses. For master counselor, master's degree and three years of experience, including one in employment counseling. Among other agencies requirements vary; most prefer master's degree in counseling or related field. In-service training often available.

For rehabilitation counselor, basic requirement is bachelor's degree with credits in counseling and related fields. Many employers require master's. Some stress work experience. For some state services, civil service exam required.

For college placement officer, minimum requirement is bachelor's degree; should be in one of the behavioral sciences. Business or other outside experience helpful. For school counselor, see p. 116.

Work Activities: Employment counselor interviews clients, takes educational and work histories, gives tests, checks references, discusses client's abilities, preferences, and job prospects with him. Locates possible job sources; should be familiar with local services and opportunities. Advises on further training if needed. Sometimes does group counseling. Most work in state employment offices; others for private or community agencies, prisons, training schools, mental hospitals.

Rehabilitation counselor works with handicapped individuals. Interviews clients, gathers available information on them. Works out rehabilitation plan in consultation with other experts such as doctors, physiotherapists. After rehabilitation helps client find job. May specialize in some particular type of handicapped person. Most rehabilitation counselors paid from state and federal funds; some hired by hospitals, insurance companies, etc.

School counselors talk with students on choice of classes and careers, study academic records and test results, maintain file of literature on various careers, give talks on career choice, lead field trips to job sites. Counselor's first task is to help student choose curriculum that will prepare him for suitable career.

College placement officer does similar work at college level, but also contacts possible employers and their representatives and helps student get part-time jobs.

Outcomes: Individuals who have chosen suitable curriculum and career.

Supervision; Social Relations: Supervised by superior in organization. May supervise paraprofessional aides. Good relations with client, other experts, and community representatives, and ability to work on a team important.

Salary; Other Benefits: In 1970, minimum salaries for state employment counselors were $6,100 to $11,600, and averaged $7,700. Maximum salaries $7,700 to nearly $14,000; mean about $9,900. May be less for voluntary agencies. Most counselors have good employee benefits.

Rehabilitation counselors in state agencies earned about $7,800-$10,000 a year. Those hired by Veterans Administration paid $13,493 or $14,665, with doctorate $13,493-$16,790. Average salary for rehabilitation workers with doctorate, $18,900.

College placement officer directors, in 1970, earned from less than $5,000 to over $27,500, with median at about $12,250. Deans of testing and counseling had median salary of $13,800.

For school counselor, see p. 116.

Role of Sexes: About half of employment counselors, 30% of rehabilitation counselors, 25% of college planning and placement counselors, are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (70th percentile) in natural sciences, public service, and literary/linguistic; extremely low (25th percentile) in office work.

Similar to: Guidance/Counseling and Social Worker.

Information

General: Average around 80th percentile on information scores; high (86th percentile) in mathematics; low (76th percentile) in biological science.

Specific: 66th percentile in aerospace, farming, health, and engineering; 70th percentile in law; 74th percentile in military, accounting, business and sales, and outdoor activities.

Similar to: Guidance/Counseling and Social Worker.

Abilities

General: Around the 76th percentile in ability scores; highest (83rd percentile) in introductory math; low (66th percentile) in three-dimensional visualization.

Similar to: Guidance/Counseling.

Others

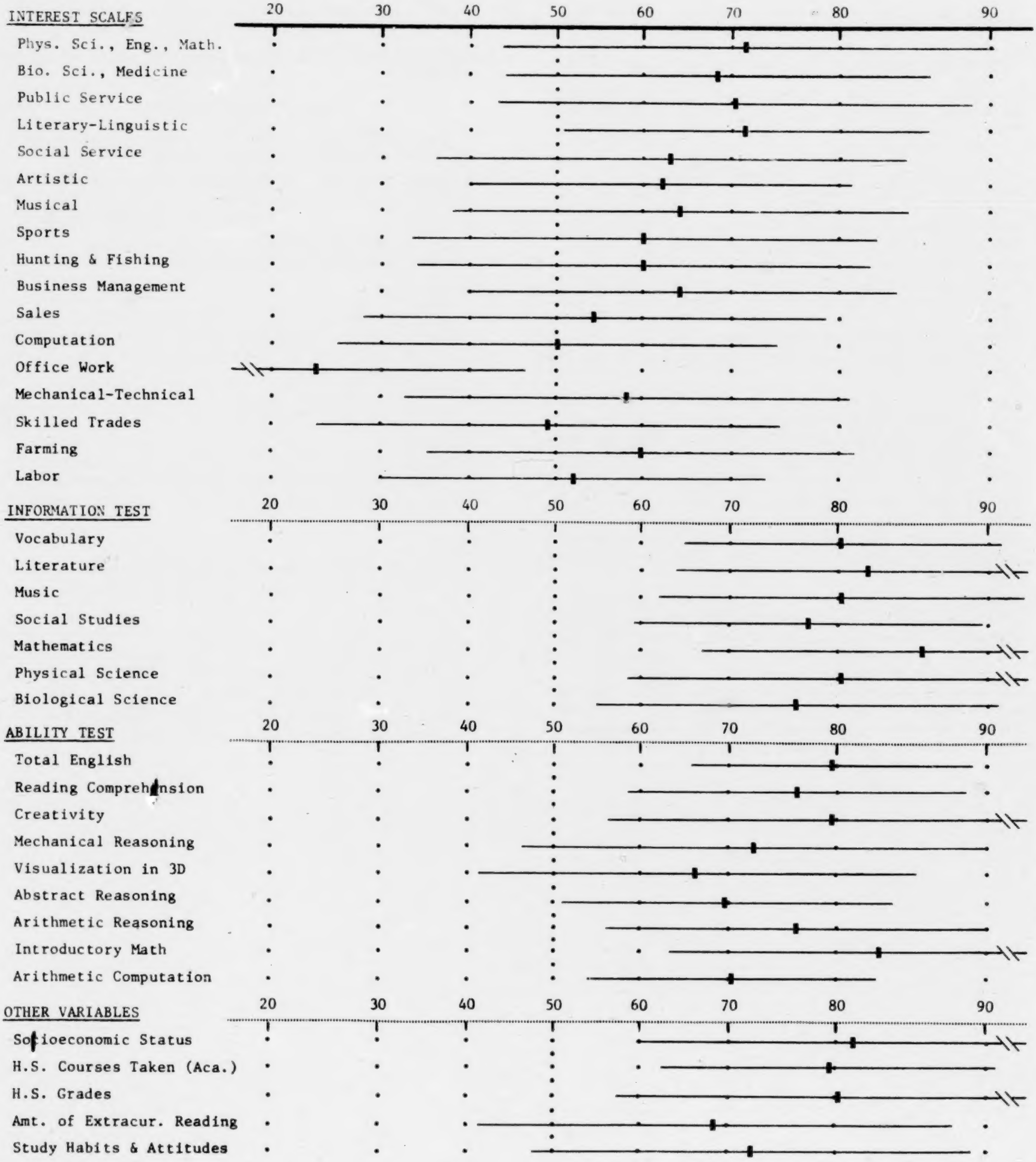
General: High (81st percentile) in socioeconomic status; low (68th percentile) in extracurricular reading.

Specific: 62nd percentile in social sensitivity and self-perception of reading skills.

Similar to: Guidance/Counseling and Social Worker (Females).

GUIDANCE - Vocational, Educational

(Female - n = 162)



SOCIAL WORKER

Importance: Population includes large numbers of unemployed, aged, and handicapped persons who need advice and financial assistance. Social workers acquainted with means of assisting and advising them.

Training: Bachelor's degree usually necessary; major in social work desirable. For some specialized jobs master's degree required. State agencies usually require examinations.

Work Activities: May do casework, group work, or community organization. Caseworkers deal directly with individuals and families, arranging welfare payments, homemaker services, foster care, etc. Group workers conduct activities. Community organization workers develop programs for health, housing, recreation, etc. Some social work activities: family service, work in child welfare, school social work, hospital social work, psychiatric social work, rehabilitation, probation and parole work; getting people to understand themselves, their families, and their problems.

Outcomes: Return of the client to independence and productiveness when possible; otherwise, helping him to live more happily and efficiently within the framework of his disability. Provision of normal living conditions for children of persons being aided.

Supervision; Social Relations: Direct supervision by immediate superior; indirect supervision by clients and community. Essential to maintain good relationship with clients for advice and recommendations to be effective.

Salary; Other Benefits: In 1971, state agencies' starting salaries for caseworkers averaged $6,600. Case work supervisors in state agencies average $8,900 to $11,300, depending mainly on experience. Psychiatric social workers same as supervisors. Social workers employed by cities started at about $7,700; city casework supervisors averaged $10,600-$13,000. In 1970, federal government paid beginners who had graduated from schools of social work $9,881 a year. With 2 years' experience started at $11,905. Fringe benefits include vacations, sick leave, and retirement.

Role of Sexes: Both men and women employed as social workers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (67th percentile) in natural sciences, public service, and literary-linguistic; lowest (25th percentile) in office work.

Similar to: Guidance/Counseling (Females) and Guidance/Vocational-Educational (Females).

Information

General: Average around 76th percentile on information scores; high (81st percentile) in mathematics; low (70th percentile) in biological science.

Specific: 69th percentile in law, and health.

Similar to: Guidance/Vocational Education (Females)

Abilities

General: Around the 69th percentile on ability scores; highest (79th percentile) in introductory math; low (56th percentile) in arithmetic computation.

Others

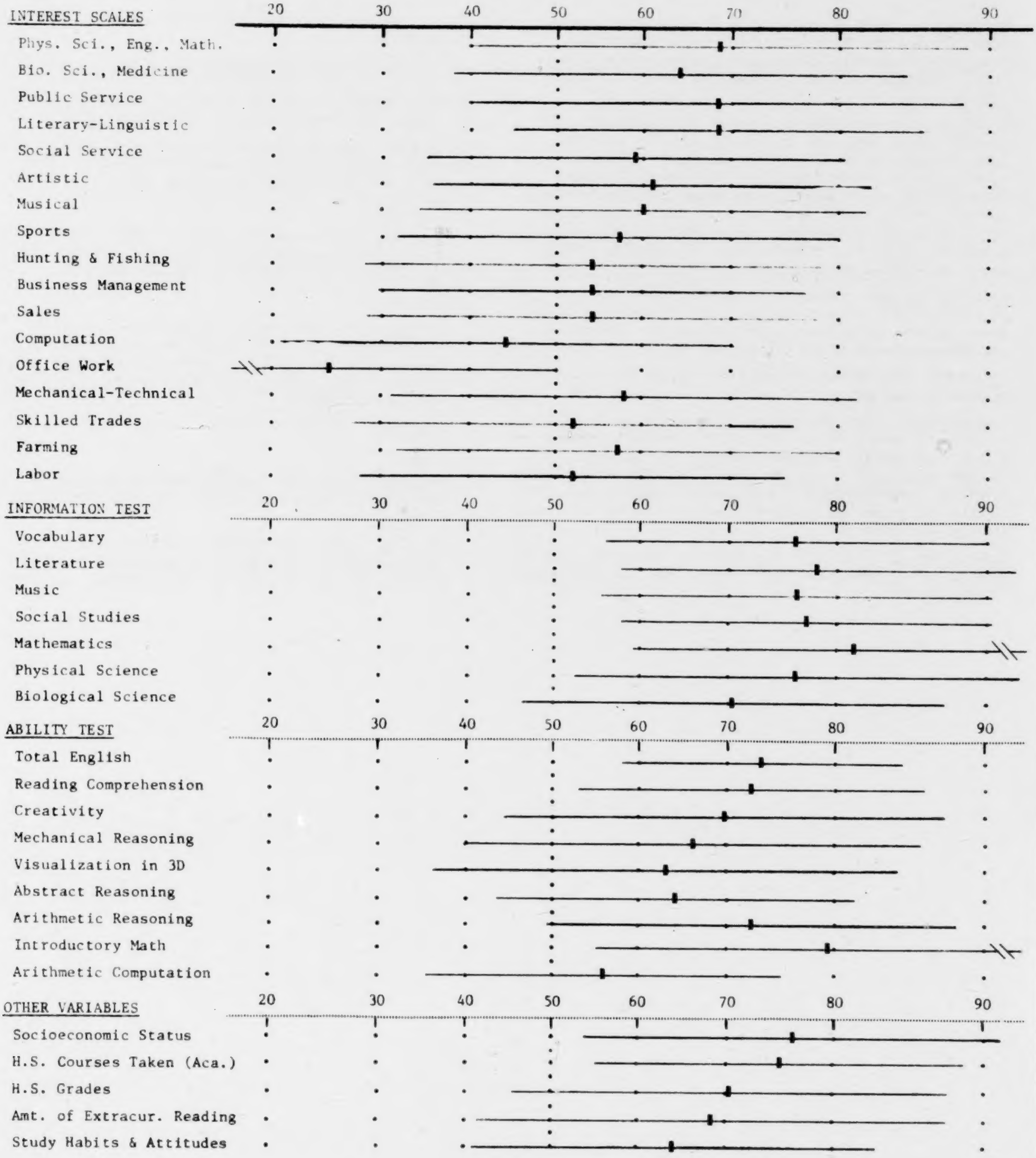
General: High (76th percentile) in socioeconomic status; low (64th percentile) in study habits and attitudes.

Specific: High (66th percentile) in maturity; 50th percentile in sociability; 58th percentile in social sensitivity, and self-confidence; 62nd percentile in self-perception of reading skills.

Similar to: Guidance/Counseling (Females) and Guidance/Vocational-Educational (Females)

SOCIAL WORKER

(Female - n = 758)



TEACHER (not elsewhere classified)

Importance: Fill the gaps in the educational system: Peace Corps workers, teachers of adult education, teachers in technical institutes, instructors in such fields as religion, yoga, karate, art, golf, riding, cooking, etc.

Training: For teachers of public adult education courses, about the same as for teachers in general (see pp. 126 and 124). For teachers in technical institutes, academic education less important than knowledge of skill they are teaching. For Peace Corps workers, requirements depend on the kind of teaching they are to do; on-the-job Peace Corps training also generally required. For teachers of specific skills, expert knowledge of that skill the chief requirement.

Work Activities: Instructs students individually or in class, plans classes and prepares teaching materials; keeps records of student's progress. For independent teachers, carries on activities to secure new students.

Outcomes: Successful transmission of needed or desired skills to students.

Supervision; Social Relations: Dependent on the type of teaching being done. For adult education, Peace Corps, and technical school teachers, usual supervision by persons above him in system. For independent teachers, supervision by students and their parents through their satisfaction or dissatisfaction with the instruction offered.

Salary; Other Benefits: Dependent on the job. Usually less than for public-school instruction, and with fewer fringe benefits.

Role of Sexes: Both men and women engage in this type of teaching.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (64th percentile) in natural sciences, public service, and literary-linguistic; lowest (34th percentile) in office work.

Information

General: Average around 76th percentile on information scores; high (82nd percentile) in mathematics; low (70th percentile) in biological science.

Abilities

General: Around the 70th percentile on ability scores; highest (80th percentile) in introductory mathematics; low (66th percentile) in three-dimensional visualization, abstract reasoning, and arithmetic computation.

Specific: 69th percentile in memory for words.

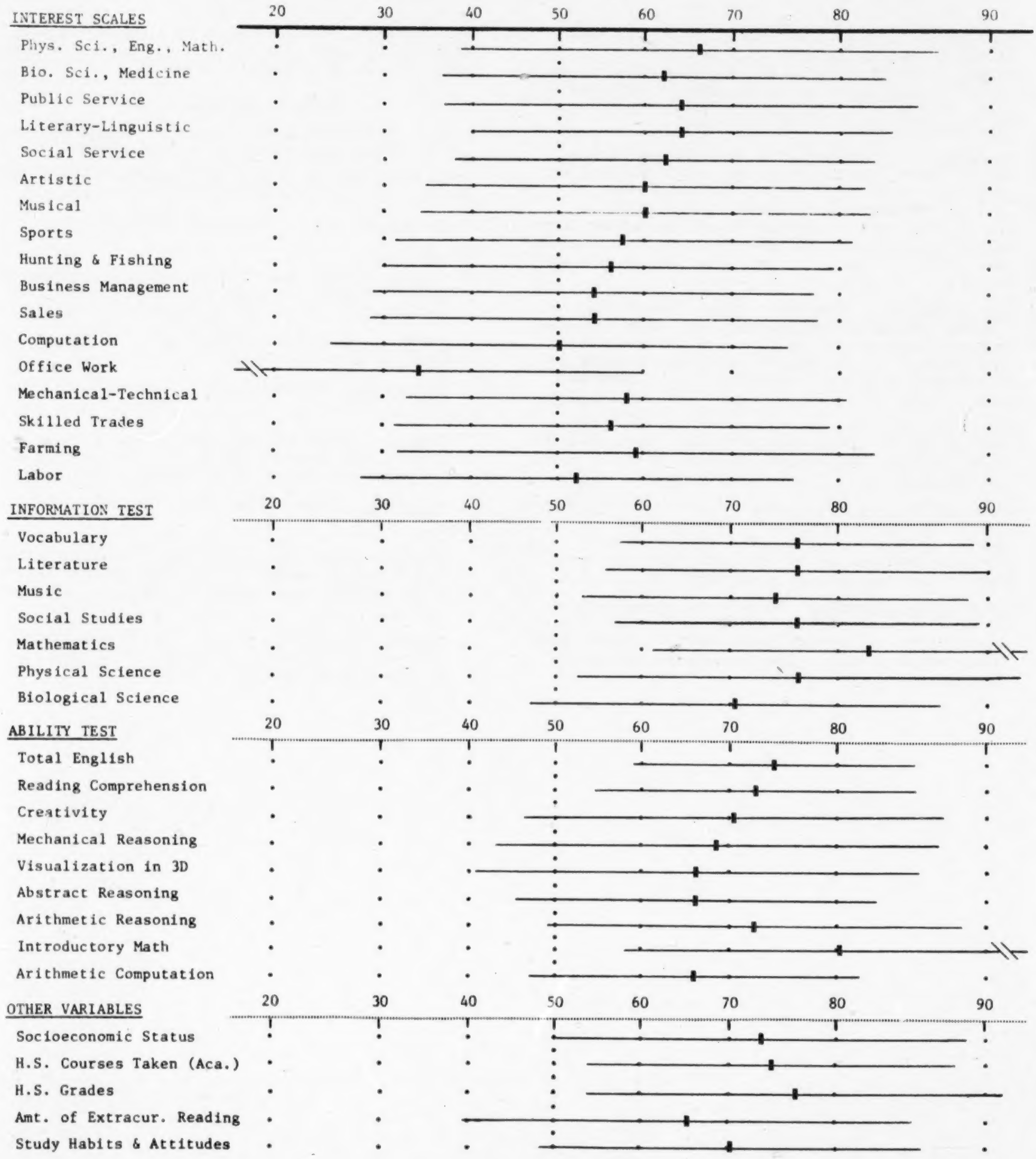
Others

General: High (76th percentile) in high school grades; low (65th percentile) in extracurricular reading.

Specific: 58th percentile in social sensitivity, self-confidence, and self-perception of reading skills; 51st percentile in sociability.

TEACHER (not elsewhere classified)

(Female - n = 5,131)



TEACHER - Elementary

Importance: Strong influence on life of each individual for six to nine years in formative period. Largest profession for women. National expenditures for education rapidly increasing because education seen as means of eradicating poverty, difference in intelligence, and class distinctions.

Training: Teachers in public schools, and in some states private schools, must have state teaching certificate. In 1970, 47 states required 4 years of college. In most states, professional education courses required. Individual school systems may have higher requirements. Emergency certificates sometimes given for lower qualifications when teacher shortage exists.

Work Activities: Elementary-school teacher instructs children in reading, mathematics, and other subjects; prepares materials for and plans future instruction, keeps records on each child's progress, monitors and encourages his personal development. In elementary school each teacher usually teaches several subjects.

Outcomes: Children able to read and do elementary mathematics and with a groundwork for future study in other subjects; socialized to work as part of a group and inculcated with current ethical ideals.

Supervision; Social Relations: Supervised by assistant principals, principals, superintendents, and school boards; in some systems by the students' parents. Must maintain good social relations with all these, with colleagues, and with students.

Salary; Other Benefits: In 1970-71, average salary $9,025. Short working day and school year, excellent opportunities for second jobs. Pension systems; minor fringe benefits such as low-cost lunches and travel. High job stability, tenure.

Role of Sexes: Great majority of elementary-school teachers are women, but tendency now is to encourage hiring of men as father-substitutes.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (66th percentile) in social service; low (36th percentile) in office work.

Similar to: Teacher/Preschool (Females).

Information

General: Around the 72nd percentile on information scores; highest (78th percentile) in mathematics; lowest (67th percentile) in biological science.

Specific: High (68th percentile) in sports, and art; 63rd percentile in health.

Similar to: Teacher/Preschool (Females).

Abilities

General: Around the 68th percentile on ability scores; high (76th percentile) in introductory math; low (60th percentile) in arithmetic computation.

Similar to: Teacher/Preschool (Females).

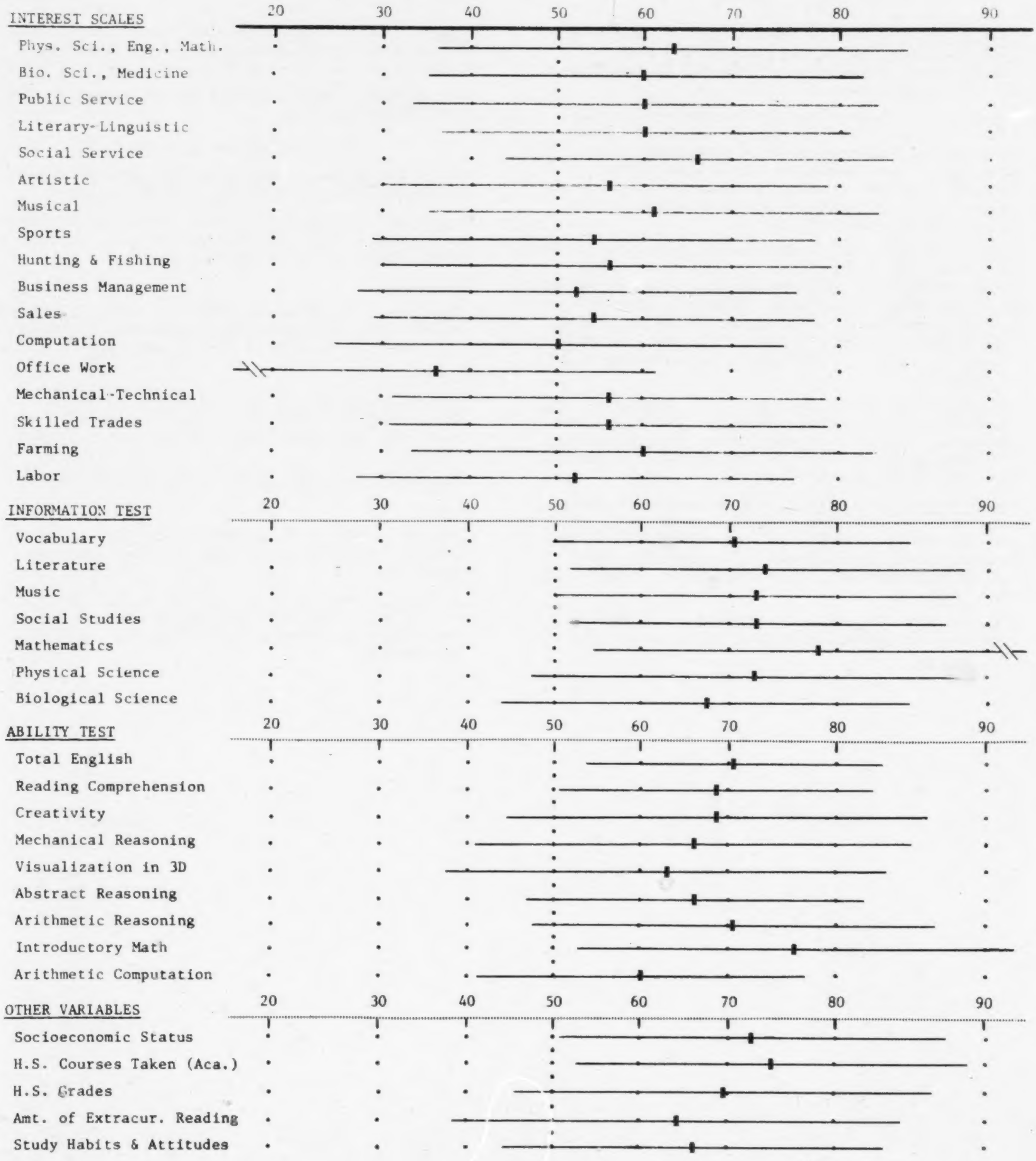
Others

General: High (74th percentile) in academic orientation of high school courses; low (65th percentile) in study habits and attitudes, and extracurricular reading.

Specific: 56th percentile in social sensitivity, self-confidence, and self-perception of reading skills; 50th percentile in sociability.

TEACHER - Elementary

(Female - n = 2, 183)



TEACHER - High School

Importance: Strong influence on life of nearly every individual for four or six years during period of adolescence. Preparation of students for employment or further education.

Training: All states require certificates for high school teachers. College degree usually required. Must have at least half-year of education courses plus one or more courses in high-school subjects. Individual states or school systems may have higher requirements. Supervisory and administrative jobs usually require master's degree.

Work Activities: High-school teachers prepare material for, plan, and teach classes in their main subject or related subjects. Lead discussion groups, advise on students' research problems. Supervise student's study; maintain records of his progress; advise on personal development and career choice. Maintain contact with student's parents. Often supervise extracurricular activities.

Outcomes: Students prepared to begin employment in outside world or to continue study in colleges, universities, or technical institutes. Inculcation of currently approved attitudes and ideals in regard to citizenship and social relations.

Supervision; Social Relations: Supervised by department heads, supervisors, assistant principals, principals, superintendents, and school boards; in some systems by students' parents. Must maintain good social relations with all these, with colleagues, and with students.

Salary; Other Benefits: In 1970-71 high school teachers averaged about $9,540. Salaries usually higher in larger school systems. Other benefits similar to those for elementary school teachers (see p. 124).

Role of Sexes: More than half of all secondary-school teachers are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (68th percentile) in physical science, public service, and literary-linguistic; lowest (28th percentile) in office work.

Information

General: Average around 80th percentile on information scores; highest (82nd percentile) in mathematics; low (76th percentile) in music, and biological science

Abilities

General: Around the 71st percentile on ability scores; highest (82nd percentile) in introductory math; low (66th percentile) in arithmetic computation.

Specific: 74th percentile in memory for words.

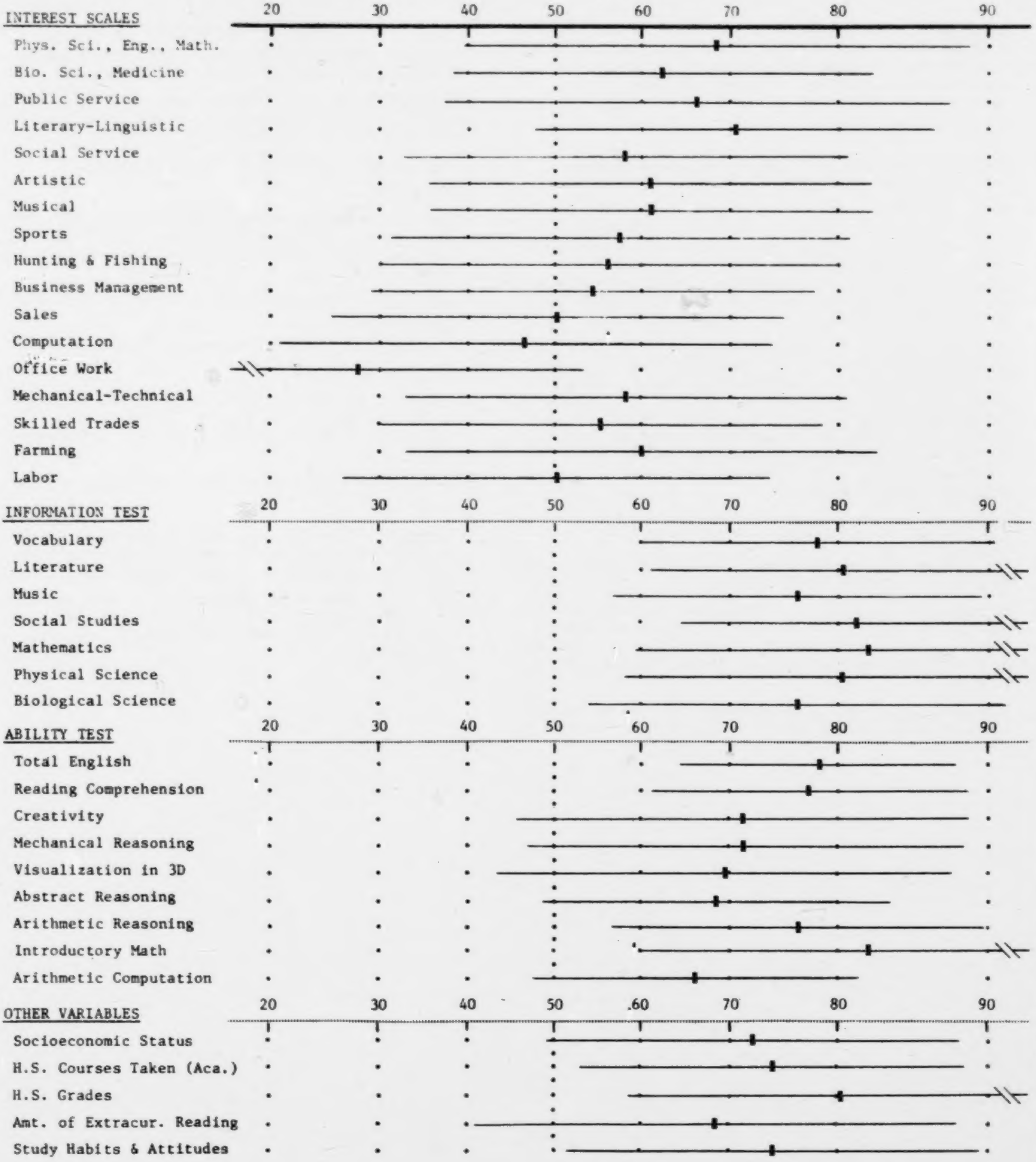
Others

General: High (80th percentile) in high school grades; low (68th percentile) in extracurricular reading.

Specific: High (69th percentile) in self-perception of reading skills; 55th percentile in sociability, and social sensitivity; 66th percentile in self-confidence.

TEACHER - High School

(Female - n = 288)



TEACHER - Preschool

Importance: New knowledge of effect of early childhood on individual's intellectual life, together with concern for the disadvantaged, have led to realization of need for instruction of young children. Also important for providing custodial care of children to enable mothers to work.

Training: For public-school kindergarten teacher, see section on Elementary School Teacher, p. 124.

For nursery school or infant school teacher working for state, federal, or local government, requirements vary but usually include some college training and courses in psychology of early childhood. For teachers employed by private kindergarten or nursery schools, requirements usually more flexible. But for professional-level jobs, bachelor's degree necessary.

Work Activities: Teaching children numbers, colors, letters, developing artistic sense, developing sense of group membership and obligations toward others, guarding health, providing suitable exercise, preparing child for first-grade work. Observing emotional development, discussing child with parents and experts, preventing and remedying personality difficulties. Teaching principles of health and nutrition. Teaching rational thought processes.

Outcomes: Children taught to function as group members and prepared for next phase of education.

Supervision; Social Relations: Supervised by superior in school; occasionally by inspectors.

Salary; Other Benefits: For teachers employed by public, see p. 124. Salaries of teachers employed by private groups, churches, etc., vary widely; sometimes low. For teachers employed by public, benefits excellent.

Role of Sexes: Nearly all kindergarten and preschool teachers women, but a few men have recently entered the field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: High score (64th percentile) in physical science, literary-linguistic, and artistic; low (28th percentile) in office work.

Similar to: Teacher/Elementary (Females)

Information

General: Average around 76th percentile on information scores; highest (80th percentile) in mathematics; lowest (73rd percentile) in vocabulary, and natural sciences.

Specific: 74th percentile in art; 67th percentile in health.

Similar to: Teacher/Elementary (Females)

Abilities

General: Around the 67th percentile on ability scores; highest (78th percentile) in introductory mathematics; lowest (54th percentile) in arithmetic computation.

Similar to: Teacher/Elementary (Females)

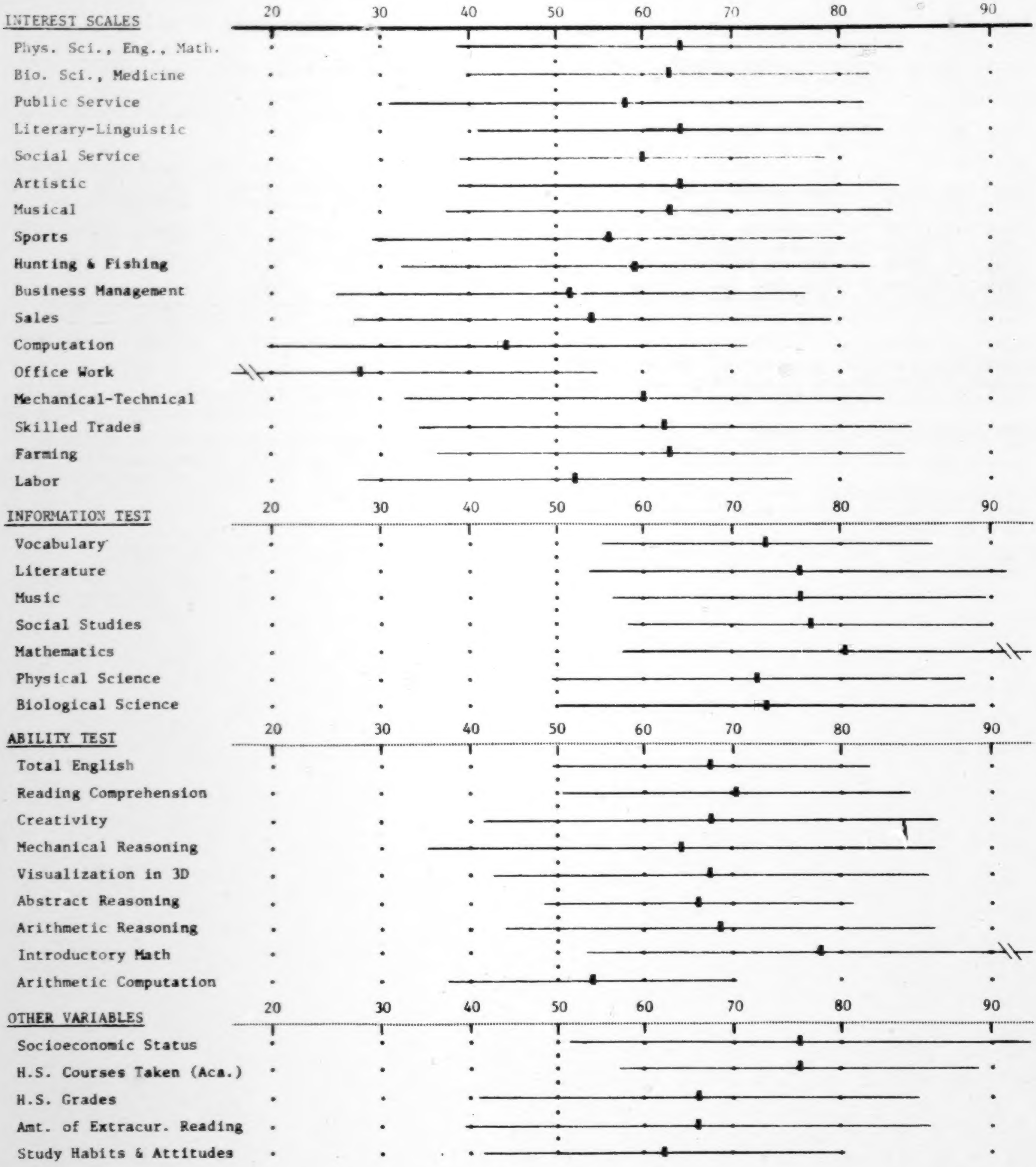
Others

General: High (76th percentile) in socioeconomic status, and academic orientation of courses taken; low (62nd percentile) in study habits and attitudes.

Specific: High (65th percentile) in self-perception of reading skills; 48th percentile in sociability; 54th percentile in social sensitivity, and self-confidence.

TEACHER - Preschool

(Female - n = 116)



TEACHER SPECIALIST - Handicapped

Importance: More attention now being given to the education of the physically, mentally, and emotionally handicapped. Classes for these included in many school systems; also held in institutions for the handicapped.

Training: Same as for other teachers, except that it should include courses in the education of the handicapped.

Work Activities: Teaches the handicapped in classes or at home the regular academic subjects plus ways of compensating for their handicap. Plans lessons and prepares teaching materials; keeps record of student's progress. Uses instrumental aids to augment deficient sensory equipment and capacity for movement. Deals with emotional difficulties due to handicapped status. Helps prepare handicapped youth for self-support.

Outcomes: Education of the handicapped youth to the limit of his capacity for self-care and self-support; helping him develop the areas in which his handicap does not interfere with functioning.

Supervision; Social Relations: Same as for teachers in general (see p. 124), with additional indirect supervision from students' physicians.

Salary; Other Benefits: For teachers in the public school system, about the same as for other teachers (see pp. 126 and 124).

Role of Sexes: Both men and women work at teaching the handicapped.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (68th percentile) in biological science; lowest (28th percentile) in office work.

Information

General: Average around 74th percentile on information scores; highest (80th percentile) in mathematics; lowest (71st percentile) in biological science.

Specific: 72nd percentile in sports, and art; 66th percentile in health.

Abilities

General: Around the 70th percentile on ability scores; highest (78th percentile) in mathematics; lowest (60th percentile) in arithmetic computation.

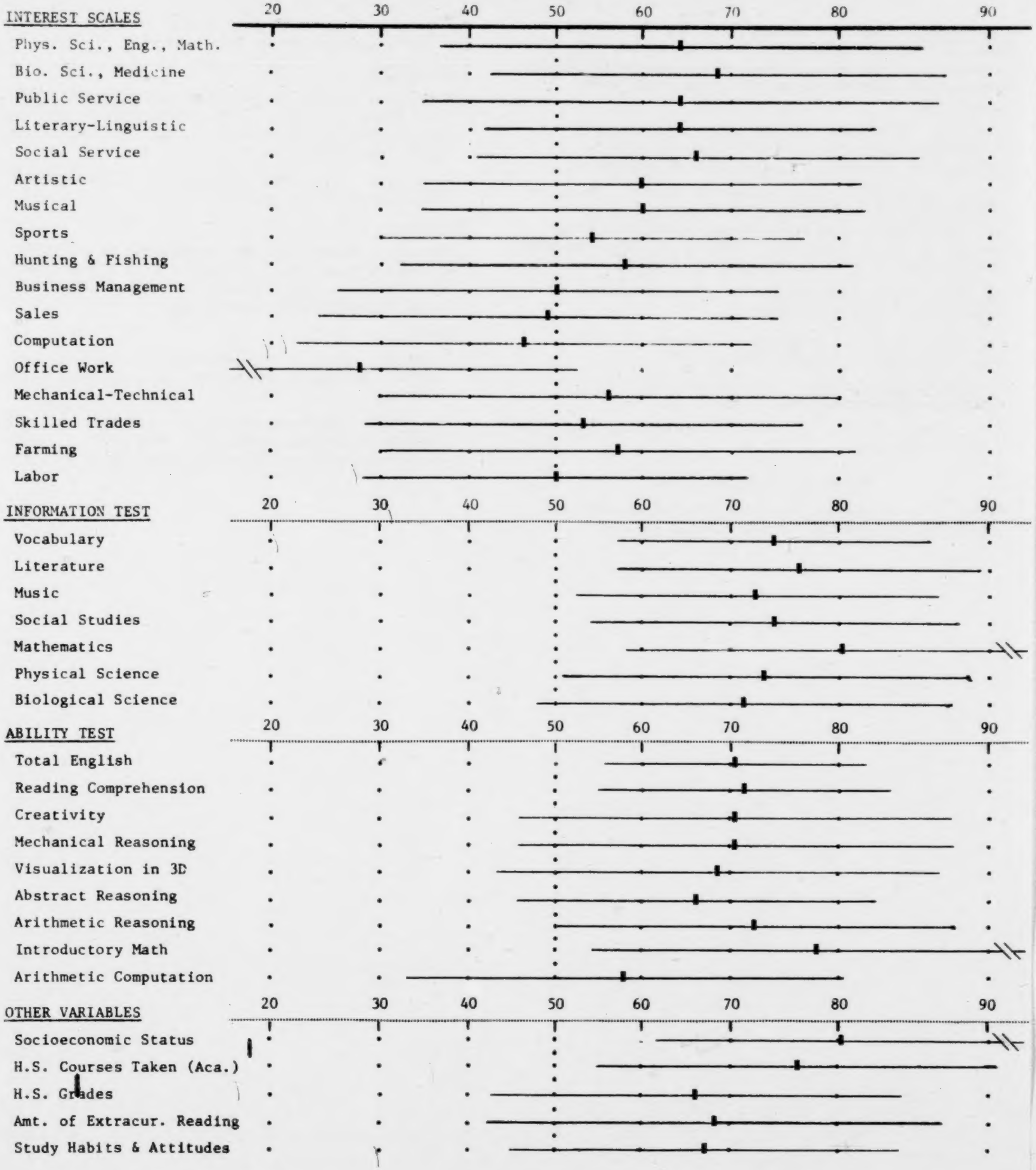
Others

General: High (80th percentile) in socioeconomic status; low (66th percentile) in high school grades.

Specific: High (68th percentile) in maturity; 50th percentile in sociability; 60th percentile in social sensitivity, self-confidence, and self-perception of reading skills.

TEACHER SPECIALIST - Handicapped

(Female - n = 257)



TEACHER SPECIALIST - Home Economics

Importance: Contributes to well-being of American home by teaching homemaking, good nutrition, and scientific child care. Makes modern scientific findings and new methods known to present and future housewives.

Training: Must meet the same state requirements for certification as other teachers (see p. 126) in addition to completing a major in home economics.

Work Activities: Teach classes and conduct laboratory periods in cooking, sewing, child rearing, home furnishing and arrangement, family relations, home management and finance, etc. They may sponsor meetings of clubs such as Future Homemakers of America and 4-H.

Outcomes: Students prepared to maintain and manage a home and to bring up children.

Supervision; Social Relations: Same as for high school teachers in general (see p. 126).

Salary; Other Benefits: Same as for high school teachers in general (see p. 126).

Role of Sexes: Nearly all high school home economics teachers are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: High (64th percentile) in skilled trades; low (38th percentile) in office work.

Information

General: Average around 70th percentile on information scores; highest (76th percentile) in mathematics, and physical science; lowest (68th percentile) in music, and biological science.

Specific: High (76th percentile) in home economics; 64th percentile in health.

Abilities

General: Around the 68th percentile on ability scores; highest (75th percentile) in three-dimensional visualization, and mathematics; lowest (64th percentile) in arithmetic computation.

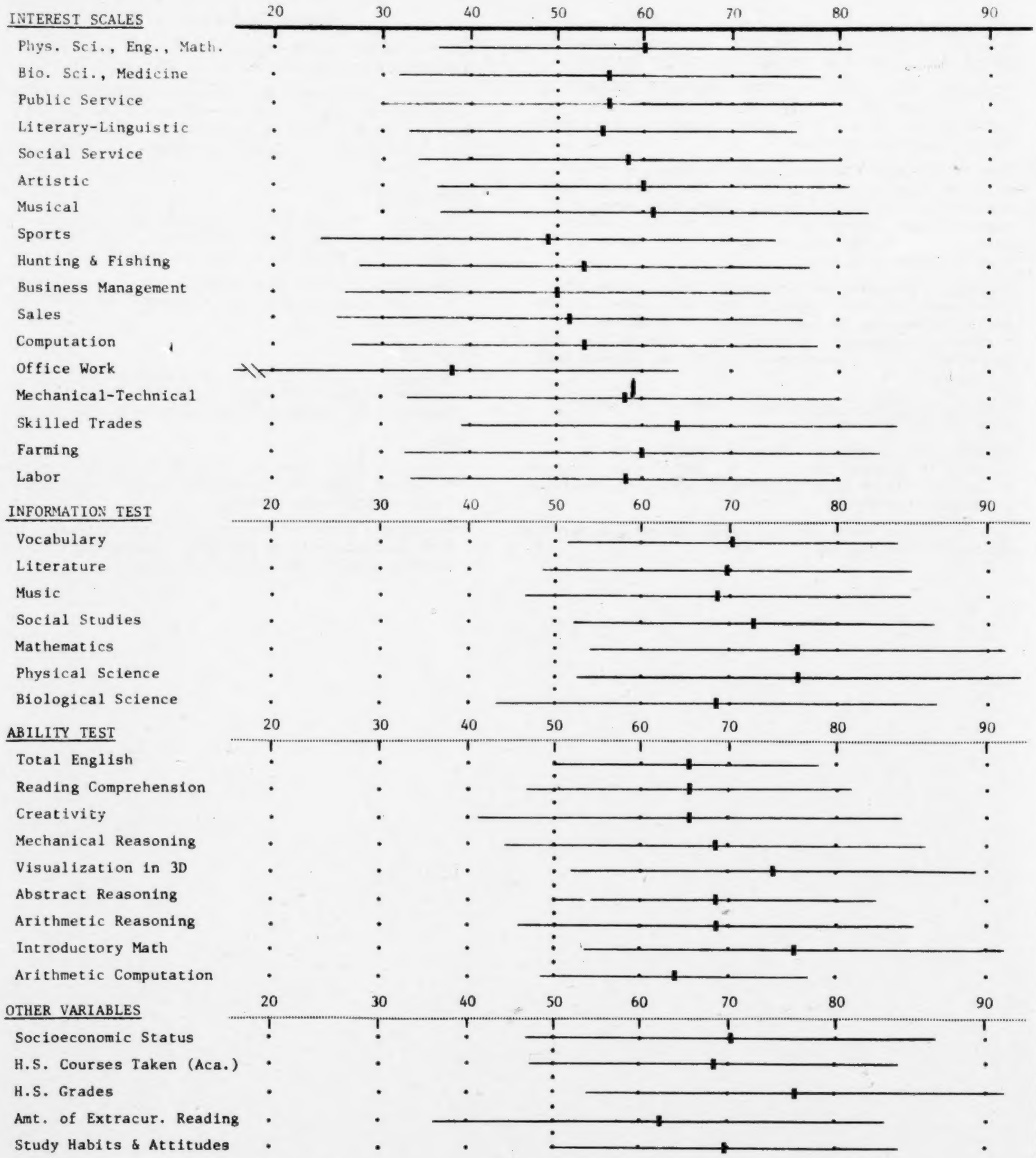
Others

General: High (76th percentile) in high school grades; low (62nd percentile) in extracurricular reading.

Specific: 50th percentile in sociability; 55th percentile in social sensitivity, and self-perception of reading skills; 57th percentile in self-confidence.

TEACHER SPECIALIST - Home Economics

(Female - n = 231)



TEACHER SPECIALIST - Physical Education

Importance: Encourages maintenance of health and physical fitness, development of interest in sports and physical activity, socialization through play.

Training: High school physical education teachers have the same requirements for certification as other teachers, but should have taken courses in the teaching of physical education.

Work Activities: Gives classes requiring physical exercise to students in general. Coaches teams for basketball, football, tennis, track, etc. when no regular coach is available. Often teaches courses in health care, sex education, etc. May serve as Dean of Boys or Girls.

Outcomes: Improved physical condition of students, development of social feeling through teamwork, building school morale through interest in team competitions, development of unusual abilities in physically gifted students, provision of a lifetime recreational interest.

Supervision; Social Relations: Same as for other high school teachers.

Salary; Other Benefits: Same as for high school teachers in general (see p. 126), except that teachers of special fields such as physical education sometimes get higher salaries.

Role of Sexes: Both men and women employed as physical education instructors.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (86th percentile) in sports; high (71st percentile) in hunting and fishing, and farming; lowest (28th percentile) in office work. (45th percentile) in business management, sales, and computation.

Information

General: Average around the 68th percentile on information scores; high (75th percentile) in mathematics; low (66th percentile) in vocabulary.

Specific: Highest (82nd percentile) in sports; 54th percentile in health; 70th percentile in outdoor activities.

Abilities

General: Around the 63rd percentile on ability scores; highest (72nd percentile) in mathematics; lowest (57th percentile) in arithmetic computation.

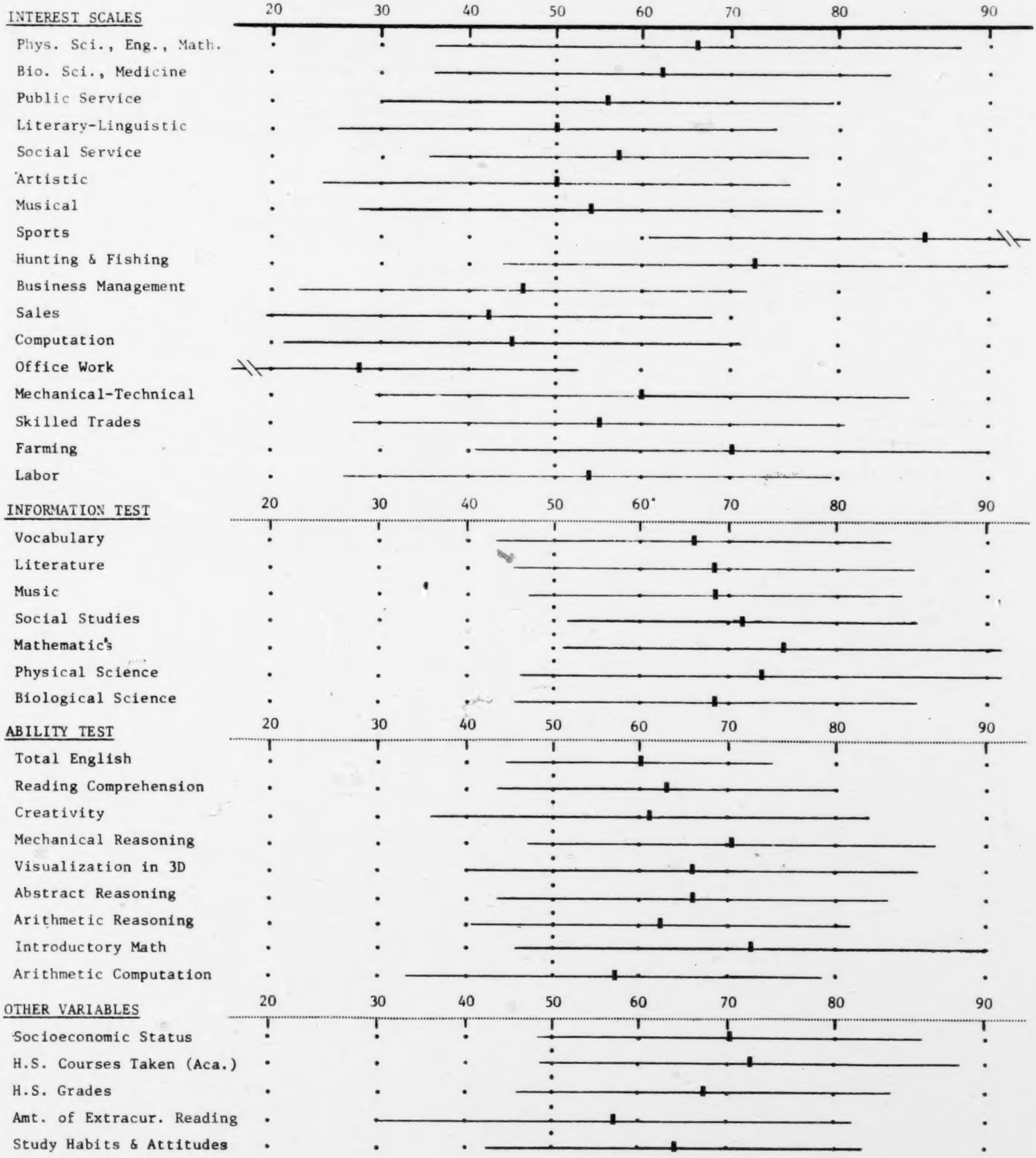
Other

General: High (72nd percentile) in academic orientation of high school courses; low (57th percentile) in extracurricular reading.

Specific: High (64th percentile) in self-confidence; 50th percentile in sociability, self-perception of reading skills, and social sensitivity.

TEACHER SPECIALIST - Physical Education

(Female - n = 171)



CHAPTER 7

CAREER GROUP 5

Humanities, Law, Social and Behavioral Sciences

Workers in Career Group 5 are all concerned with the study of human behavior. Workers in the humanities are primarily interested in the products of human creativity. In the social sciences, workers are more concerned with how human beings live together, and how they act under certain circumstances. Workers in law are concerned with how human beings act in relation to the laws. Many workers in Career Group 5 teach or do research. Many others work as consultants or professionals in government organizations or in businesses. A small number of workers in Career Group 5 are self-employed.

Nearly all workers in Career Group 5 are required to have completed at least four years of college. Many have done graduate work in their chosen field. We have included the following occupations in Career Group 5:

- Diplomat (A)
- Economist (B)
- Journalist, Reporter (C)
- Lawyer (D)
- Librarian (Females) (e)
- Psychologist (F)
- Social Scientist (G)
- Teacher
  - College (not elsewhere classified) (H)
  - English
    - College (Females) (i)
    - High School (Females) (j)
  - Foreign Language
    - College (Females) (k)
    - High School (Females) (l)
  - Social Sciences and Studies
    - College (M)
    - High School (N)
- Writer (Females) (r)

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (78th percentile) in literary-linguistic; high (66th percentile) in musical and public service; lowest (37th percentile) in office work, and skilled trades.

Information

General: Average around 82nd percentile on information scores; highest (86th percentile) in literature; lowest (73rd percentile) in biological science.

Abilities

General: Around the 70th percentile on ability scores; highest (83rd percentile) in English, reading comprehension, and introductory math; lowest (62nd percentile) in three-dimensional visualization.

Specific: 74th percentile in memory for words.

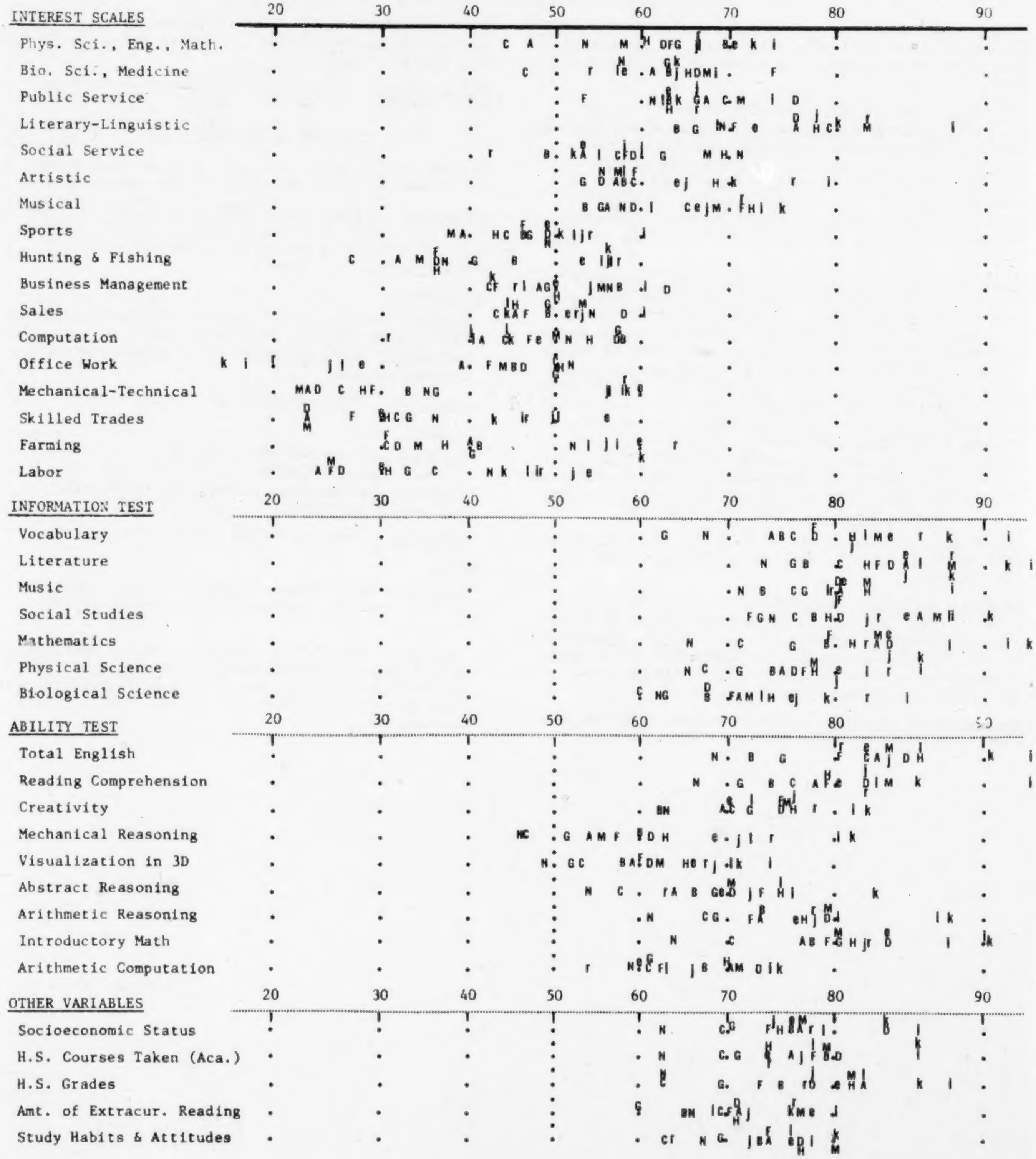
Others

General: High (79th percentile) in high school grades; low (74th percentile) in extracurricular reading.

Specific: High (75th percentile) in self-perception of writing and reading skills; 47th percentile in sociability; 60th percentile in social sensitivity; 62nd percentile in self-confidence.

CAREER GROUP 5

Humanities, Law, Social and Behavioral Sciences



DIPLOMAT

Importance: Diplomats maintain good relations between own country and country to which they are assigned; facilitate trade, protect interests of fellow-countrymen.

Training: College degree usually essential except for political appointments of already prominent persons. Person planning career in foreign service can take competitive examination for job as foreign service officer. Languages, or ability to acquire them, an important qualification. Good manners, knowledge of social customs, ability to adapt to them, necessary. Diplomat should have good background in world political affairs.

Work Activities: Diplomat usually begins as junior foreign service officer, employed as an assistant at a diplomatic installation. Later may serve as consul, in charge of trade and personal interests of American nationals. Is gradually promoted as ability to handle affairs increases. At lower ranks, foreign service officer answers mail, helps run office for senior, fulfills social duties, looks after interests of stranded and jailed Americans, sees to shipping bodies home. At rank of diplomat confers with officials of host country, explains American attitudes and policies, reports to Washington any intelligence affecting American interests. Represents United States at official functions. Fosters American trade interests.

Outcomes: Friendly relations with host country; amiable solving of disputes or problems which might lead to ill feeling.

Supervision; Social Relations: In early phases of career future diplomat is closely supervised by superiors in embassy or consulate. As diplomat, supervised by officials in home office in Washington and by heads of government. Good relations with colleagues and with officials of host country essential.

Salary; Other Benefits: Foreign service officers earn moderately high salaries, have excellent benefits. Expenses, however, are high. Diplomat at top levels, as to Britain, usually has to draw on own funds to fulfill duties of post.

Role of Sexes: A few women have recently risen or been appointed to diplomatic rank.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (76th percentile) in literary-linguistic; high (67th percentile) in public service; very low (23rd percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around 80th percentile on information scores; highest (86th percentile) in literature and social studies; lowest (71st percentile) in biological science.

Specific: 75th percentile in foreign travel.

Abilities

General: Around the 70th percentile on ability scores; highest (80th percentile) in English, and reading comprehension; lowest (54th percentile) in mechanical reasoning.

Specific: 79th percentile in memory for words.

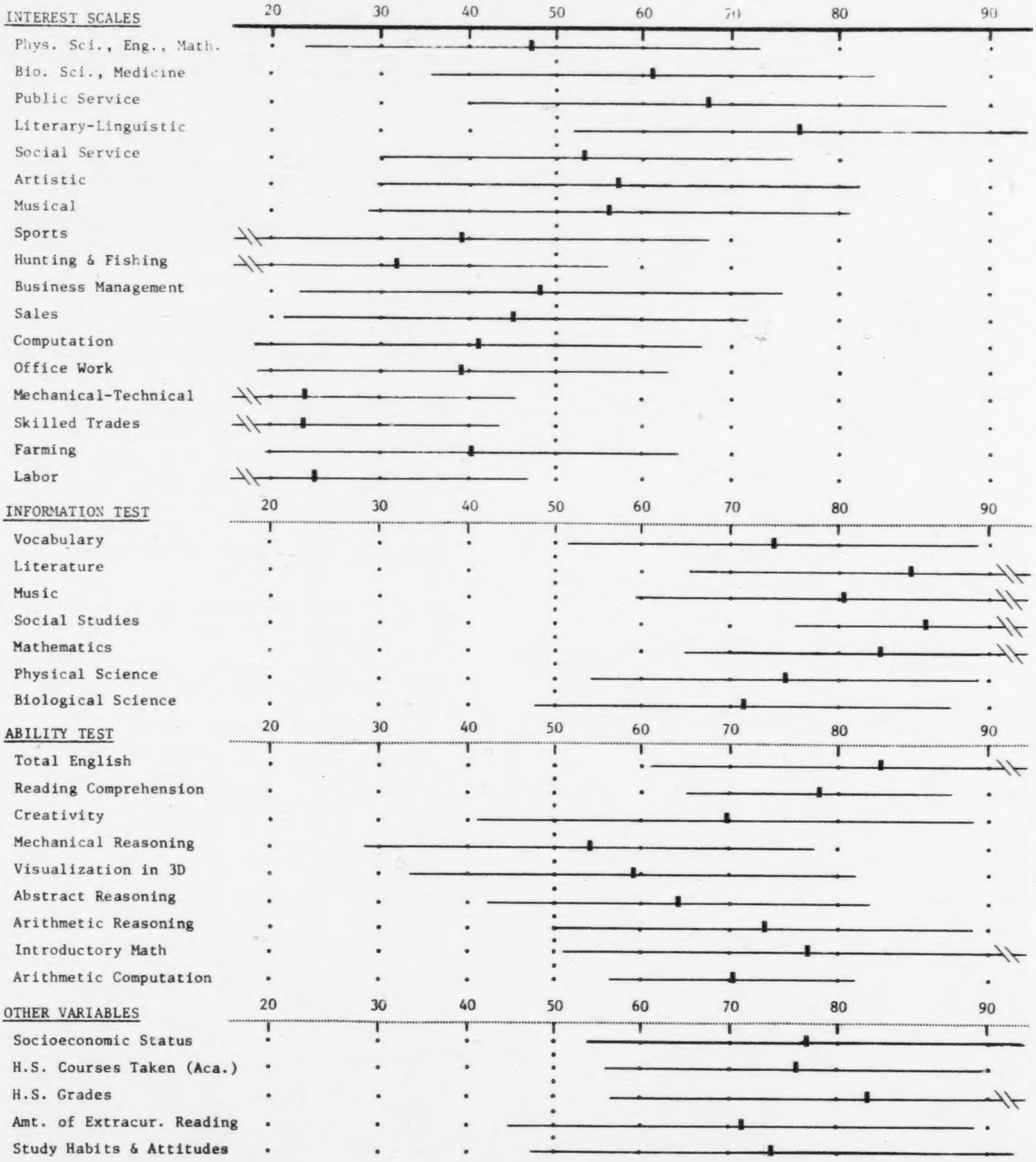
Others

General: High (82nd percentile) in high school grades; low (71st percentile) in extracurricular reading.

Specific: High (74th percentile) in self-perception of writing and reading skills; 45th percentile in sociability; 63rd percentile in social sensitivity; 54th percentile in self-confidence; 70th percentile in maturity.

DIPLOMAT

(Male - n = 71)



ECONOMIST

Importance: Economists needed to evaluate and forecast business trends, guide monetary policy, evaluate results of financial, governmental, and business experiments.

Training: For beginning jobs, economist needs at least bachelor's degree with major in economics. To enter government service must have 21 semester hours in economics and 3 in statistics. For teaching, master's degree usually needed; desirable in business or government work. Ph.D. necessary for professorship; helpful in other lines of work.

Economist needs to know economic theory and methods of economic analysis, including statistics. Needs accuracy, interest in detail, ability to write well.

Typical Work Activities: Studies use of resources such as land, materials, manpower. May work on control of inflation, tax policy, international trade, cause of depressions, or other special field. Observes economic conditions in relation to government policy. For industries, helps determine prices, markets, new lines of merchandise, entrance into international trade, business expansion.

Over half of economists work for industry and business, over 1/4 for colleges and universities, about 1/6 for government.

Outcomes: Correct estimating of economic situations; correct forecasting of economic trends. For teachers, students well grounded in economics.

Supervision; Social Relations: Supervised by superior in office or department; a few self-employed. Must be able to work as member of team.

Salary; Other Benefits: In 1970, beginning economists with bachelor's degrees going to work for federal government earned $6,548 or $8,098. With 2 years of graduate training or experience started at $9,881. Experienced economists with federal government usually earned $14,000-$23,000 a year. College and university teachers of economics had median salary of $18,000. In business, industry, and work for non-profit organizations had median salary of $20,000.

Role of Sexes: Most economists are men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (above 62nd percentile) in natural sciences, public service, and literary-linguistic; low (31st percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around the 75th percentile on information scores; highest (78th percentile) in social studies, and mathematics; lowest (67th percentile) in biological science.

Specific: High (76th percentile) in accounting, business and sales; 73rd percentile in law.

Abilities

General: Around the 67th percentile on ability scores; highest (76th percentile) in reading comprehension, and introductory mathematics; lowest (54th percentile) in three-dimensional visualization.

Specific: 80th percentile in advanced math.

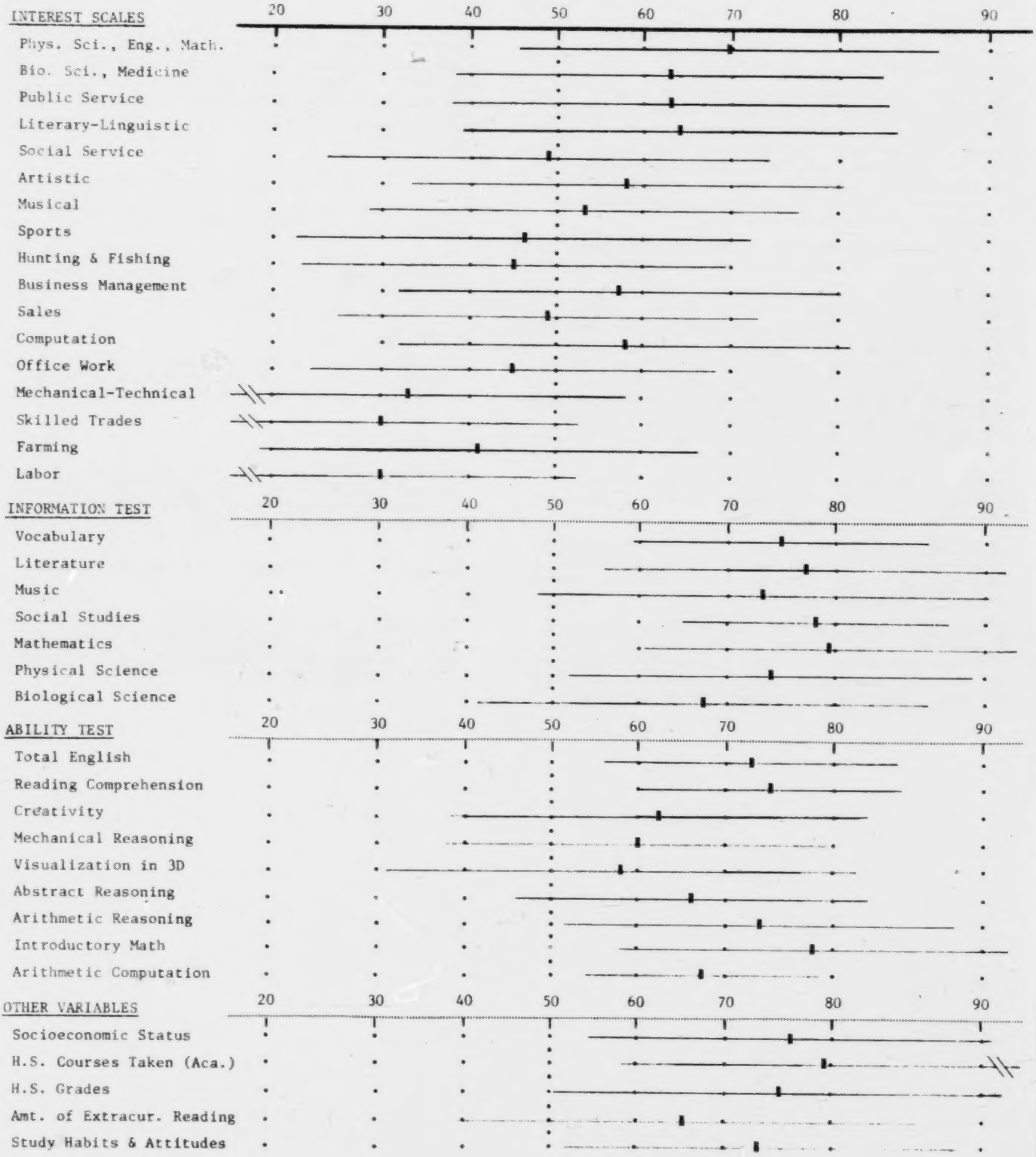
Others

General: High (79th percentile) in academic orientation of courses; low (65th percentile) in extracurricular reading.

Specific: 54th percentile in sociability; 60th percentile in self-perception of writing and reading skills.

ECONOMIST

(Male - n = 84)



JOURNALIST, REPORTER

Importance: Journalism and reporting necessary for keeping public well-informed on matters of public concern. Also provide entertainment.

Training: College education usually necessary. Some employers prefer it in journalism, others in liberal arts. On rural, small-town, or suburban papers degree may not be required. College curriculum should include courses in writing, sociology, political science, etc. Foreign language helpful. Many reporters specialize in some one field such as science; these should take courses in their field of specialty.

Physical stamina, curiosity, persistence, resourcefulness necessary. Typing necessary, photography helpful.

Work Activities: Gather information on current happenings of public interest, interview people, attend happenings, write and edit news stories. May specialize in some particular field such as politics, business, religion. May write "background" articles to explain past circumstances leading up to current events, as article on history of Palestine as background for Arab-Israeli controversy. On small papers may not only collect local news but do photography, write headlines and editorials, lay out pages, do general office work.

Outcomes: Interesting and accurate news articles, background articles or pictures; successful completion of general newspaper duties.

Supervision; Social Relations: Supervised by superior in newspaper office or by editor. Some free-lance or self-employed. Good relations with persons who may be sources of news essential.

Salary; Other Benefits: On many papers salaries set by contracts with Newspaper Guild. In 1970, minimum starting salaries on such papers about $100-$135 week for beginning reporters. On a few small papers under $90 week. Copy boys with some experience $65-$120 week. For employees with 4-6 years' experience Guild contracts usually called for $170-$230 week; less on a few small dailies, more on a few large dailies. Experienced, successful reporters on city dailies may earn over $300 week. Night work often necessary.

Role of Sexes: In 1970 35% of newspaper reporters were women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (79th percentile) in literary-linguistic; high (68th percentile) in public service and musical; quite low (27th percentile) in hunting and fishing, and mechanical-technical.

Information

General: Average around the 76th percentile in information scores; highest (80th percentile) in literature; lowest (60th percentile) in biological science.

Abilities

General: Around the 67th percentile on ability scores; highest (above 76th percentile) in English, and reading comprehension; low (50th percentile) in mechanical reasoning and three-dimensional visualization.

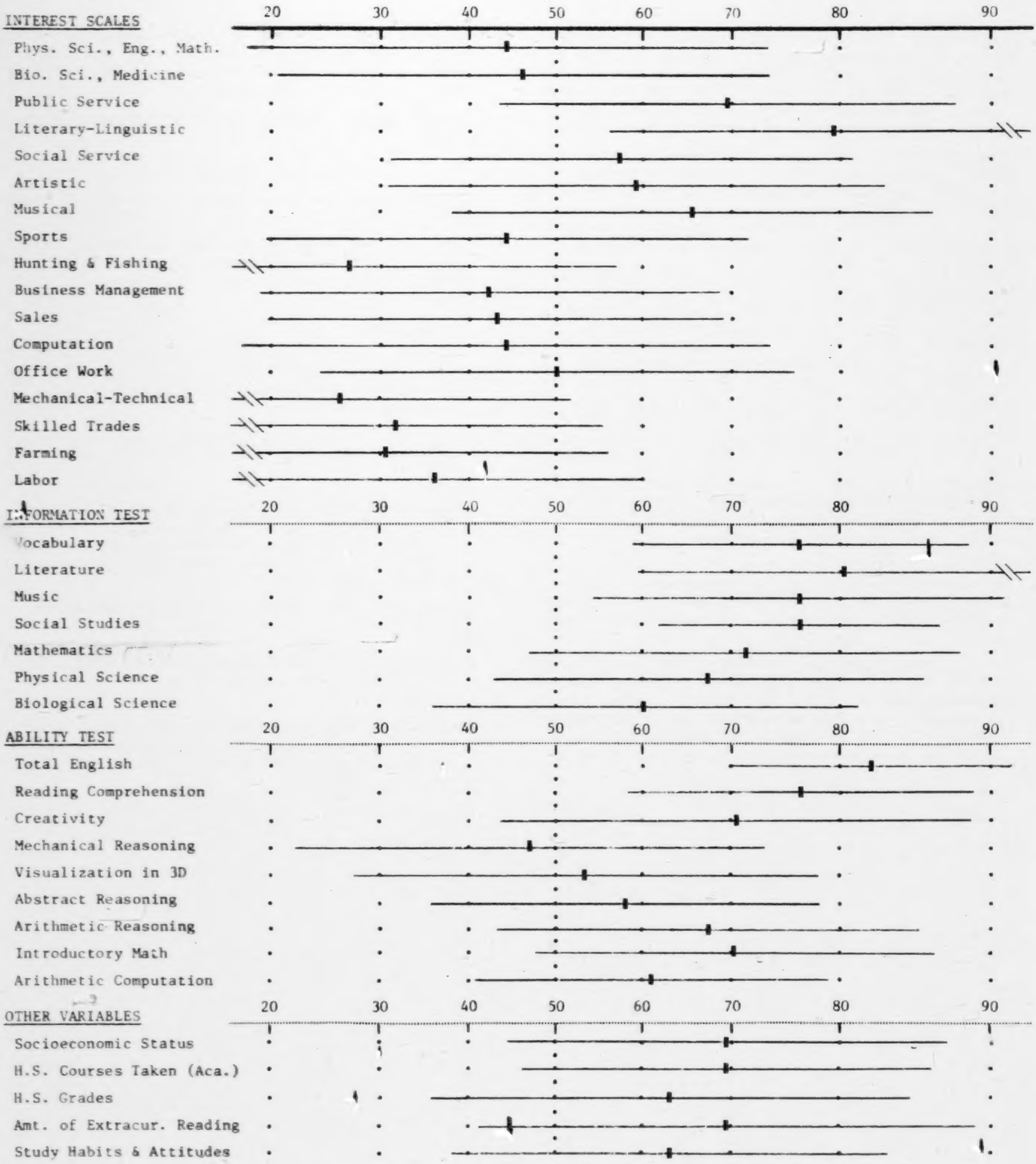
Specific: 73rd percentile in memory for words.

Others

Specific: High (84th percentile) in self-perception of writing skills; 64th percentile in self-confidence, and self-perception of reading skills; 59th percentile in social sensitivity.

JOURNALIST, REPORTER

(Male - n = 126)



LAWYER

Importance: Legal system too complicated for ordinary person to understand; system of justice is built on idea of struggle between two legally-trained adversaries. Difficult for individual to approach courts without aid of lawyer. Lawyers often needed when dealing with government, in regard to taxes, etc.

Training: In most states, seven years of training beyond high school, including graduation from an accredited law school. Admission to law school usually requires passing Law School Admissions Test. Some states also require experience as law clerk. Examination for admission to bar required in most states.

Work Activities: Lawyer usually works for law firm a few years then starts own practice. In 1970 three-fourths of all lawyers in private practice. Others work for private firms, including industries, for government agencies, etc. Lawyer upholds his client's cases in court, often settles them out of court. Determines legality of proposed actions. Settles estates, draws up wills, takes care of trust funds. Represents clients in dealing with government agencies. Some lawyers specialize in such fields as tax or corporation law. Some work for government in administrating laws.

Outcomes: Interests of client upheld in dealing with court system and with government. Property administered. Legality of proposed actions determined. Federal and state laws administered.

Supervision; Social Relations: If in own practice, self-supervised according to professional ethics, general supervision by Bar Association. If in law or business firm or government, also supervised by superiors.

Salary; Other Benefits: Earnings high. In 1970, lawyers for business firms started at $11,500 a year; in government jobs at $9,881 or $11,905. Lawyers with a few years' experience averaged $16,800 if working for business; $16,760 if working for government. Income of lawyers in private practice varies widely but is generally high. In some states lawyers permitted to take percentage of every estate brought to probate on death of client. When self-employed, sets own priorities of time and activities.

Role of Sexes: Both men and women are admitted to the bar.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (76th percentile) in public service, and literary-linguistic; lowest (25th percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around 80th percentile on information scores; highest (84th percentile) in literature, and mathematics; lowest (67th percentile) in biological science.

Specific: High (82nd percentile) in accounting, business and sales; 80th percentile in law.

Abilities

General: Around the 75th percentile on ability scores; highest (above 82nd percentile) in English, reading comprehension, and mathematics; lowest (61st percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 73rd percentile in memory for words.

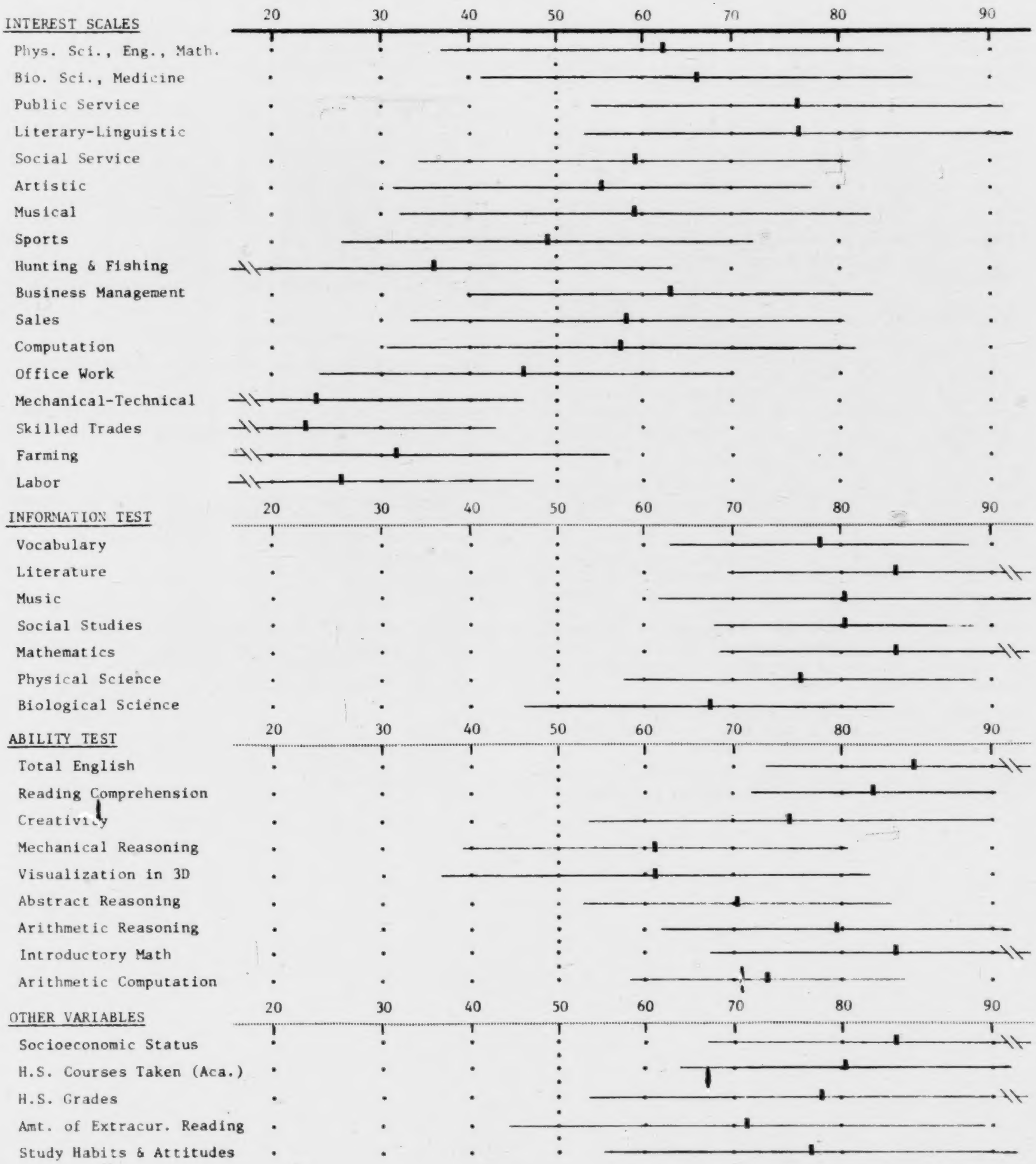
Others

General: High (84th percentile) in socioeconomic status; low (71st percentile) in extracurricular reading.

Specific: High (75th percentile) in self-perception of writing and reading skills; 62nd percentile in sociability; 68th percentile in social sensitivity, and self-confidence.

LAWYER

(Male - n = 1,110)



LIBRARIAN

Importance: Librarian often supervisor of the voluntary learning that goes on in the community. Makes information available where it is needed. Useful to science, business, and industry as well as to scholarship and recreation.

Training: Master's degree in library science usually required. Ph.D. desirable for top jobs. Entrance to most library schools requires, besides college degree, reading knowledge of a foreign language. Librarians of special libraries need knowledge of subject matter and will find degrees in it useful. Ability to use computers increasingly desirable. In most states school librarians must meet requirements for teaching certificates.

Work Activities: Duties depend on type of job and type of library. In small libraries librarian may do purchasing, classifying, and cataloging and provide reference service, as well as serving public. In large ones may specialize in reader services (work with public) or technical services. In public libraries serve general public as well as students. Acquisition librarians purchase books, etc. Catalogers classify books and prepare catalogs. Reference librarians aid search for information. Children's librarians assist children, tell stories, etc. Adult services librarians advise adults, conduct educational programs. Bookmobile librarians take books to rural regions, ghettoes, hospitals, etc. School librarians teach students use of library, work with teachers in planning lessons. College and university librarians have similar duties; may specialize in a certain field. Special librarians manage libraries of commercial firms, government agencies, etc., keep up with new information in library's special field. Information science specialists work in technical libraries; specialize in information retrieval in library's field.

Outcomes: Contribution to education and research projects of library clients, provision of recreational materials, location of needed information.

Supervision; Social Relations: In very small libraries librarian usually supervised by Library Board or, if library privately owned, by company officials. In large libraries supervised by superiors on library staff. Friendly social relations with library clients a necessity.

Salary; Other Benefits: Moderately high. The starting salary of newly graduated librarians averaged about $8,700 in 1970. College, school, and special libraries paid more than others. Very experienced librarians and those with a Ph.D. in a subject matter field earned $10,000 to $15,000. Special librarians averaged $11,800. If library publicly owned, often excellent fringe benefits.

Role of Sexes: 85% of all librarians are women. Men mainly in administrative jobs or technical and special library jobs.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (71st percentile) in physical science, and literary-linguistic; lowest (28th percentile) in office work.

Information

General: Average around 84th percentile on information scores; highest (85th percentile) in literature, and social studies; lowest (76th percentile) in biological science.

Abilities

General: Around the 70th percentile on ability scores; highest (82nd percentile) in English, reading comprehension, and mathematics; lowest (60th percentile) in arithmetic computation.

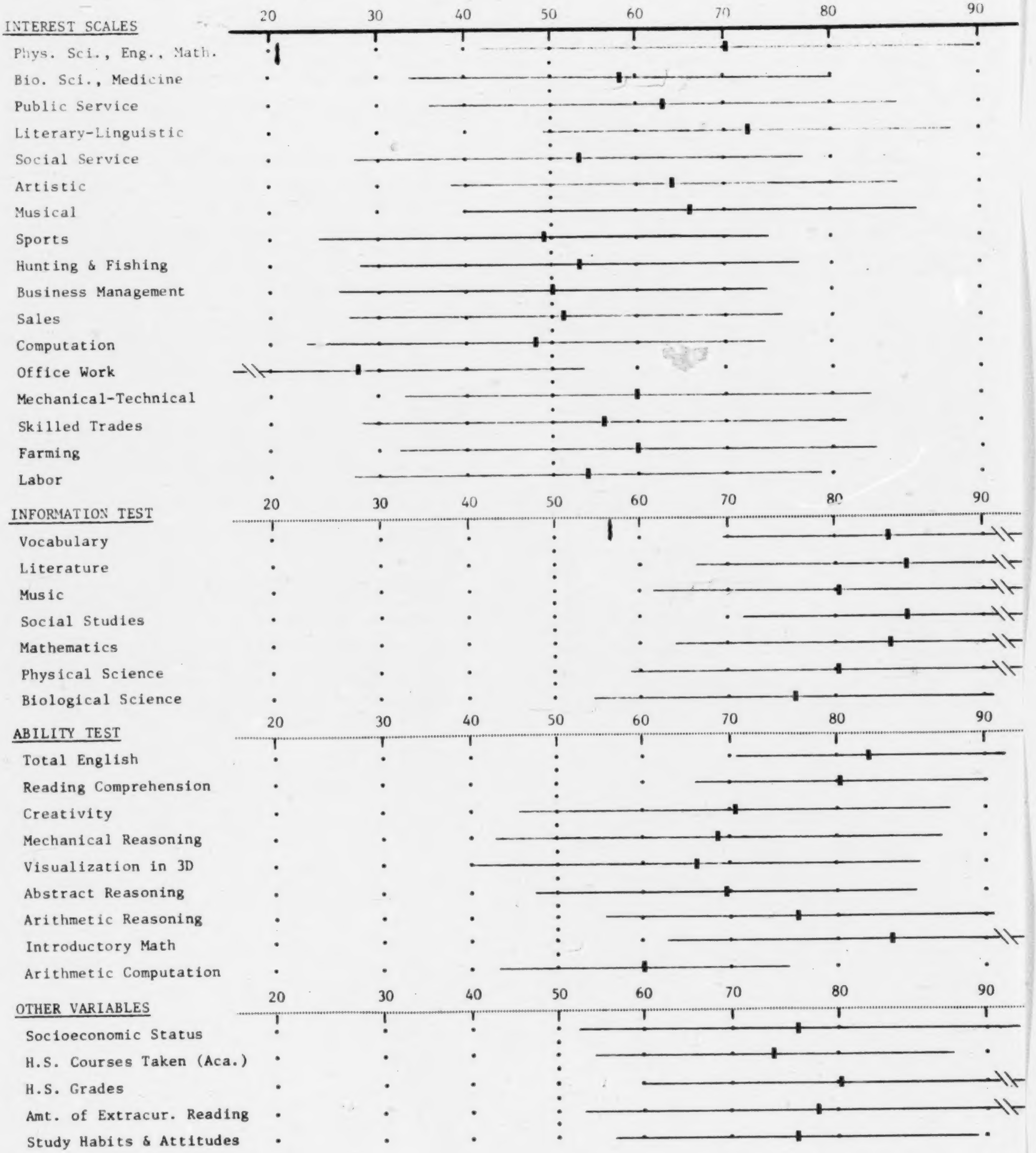
Specific: 74th percentile in memory for words.

Others

General: High (80th percentile) in high school grades; low (74th percentile) in academic orientation of courses.

LIBRARIAN

(Female - n = 293)



PSYCHOLOGIST

Importance: Psychology sometimes helps in solving social, educational, and personal problems, and in the proper treatment of medical patients.

Training: Need master's degree with major in psychology. Ph.D. needed for some jobs; helpful for advancement. In clinical or counseling psychology also need year's internship or supervised work. For independent practice state licensing necessary. Undergraduate work should include major in psychology, courses in science and statistics. Good communication skills essential.

Work Activities: Psychologists usually specialize in some particular field. May be clinical, experimental, developmental, personality and social psychologists, school, comparative, physiological, counseling, educational, industrial, engineering psychologists. May teach, counsel, conduct training programs, do research, administer tests and rating scales, advise on administrative policies, conduct surveys and experiments.

Three-fifths of all psychologists work for colleges and universities. Also for government, especially Veterans Administration. Some work for schools and clinics, some self-employed.

Outcomes: Individuals aided in self-understanding, knowledge of psychology and its principles extended, new psychological facts ascertained, correct diagnoses made, plans made in accordance with sound psychological principles.

Supervision; Social Relations: Supervised by superior in place of employment. Good social relations with patients, subjects, and colleagues important.

Salary; Other Benefits: In 1970 psychologists had median salary of about $15,000; $16,000 for Ph.D.'s. Self-employed usually higher. Starting salary for psychologist with master's degree about $9,600; with Ph.D. $10,900. In college and university, assistant professors earned about $11,700; full professors $19,200, for academic year. Ph.D. with some experience going to work for federal government started at $13,493. Average salary for Veterans Administration psychologists (all Ph.D.'s) was $18,800.

Role of Sexes: About one-quarter of psychologists women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (73rd percentile) in biological science and medicine, literary-linguistic, and musical; lowest (29th percentile) in mechanical-technical, skilled trades, farming, and labor.

Information

General: Average around 78th percentile on information scores; highest (83rd percentile) in literature; lowest (70th percentile) in biological science.

Abilities

General: Around the 73rd percentile on ability scores; highest (79th percentile) in English, reading comprehension, and mathematics; lowest (60th percentile) in mechanical reasoning, three-dimensional visualization, and arithmetic computation.

Specific: 75th percentile in memory for words.

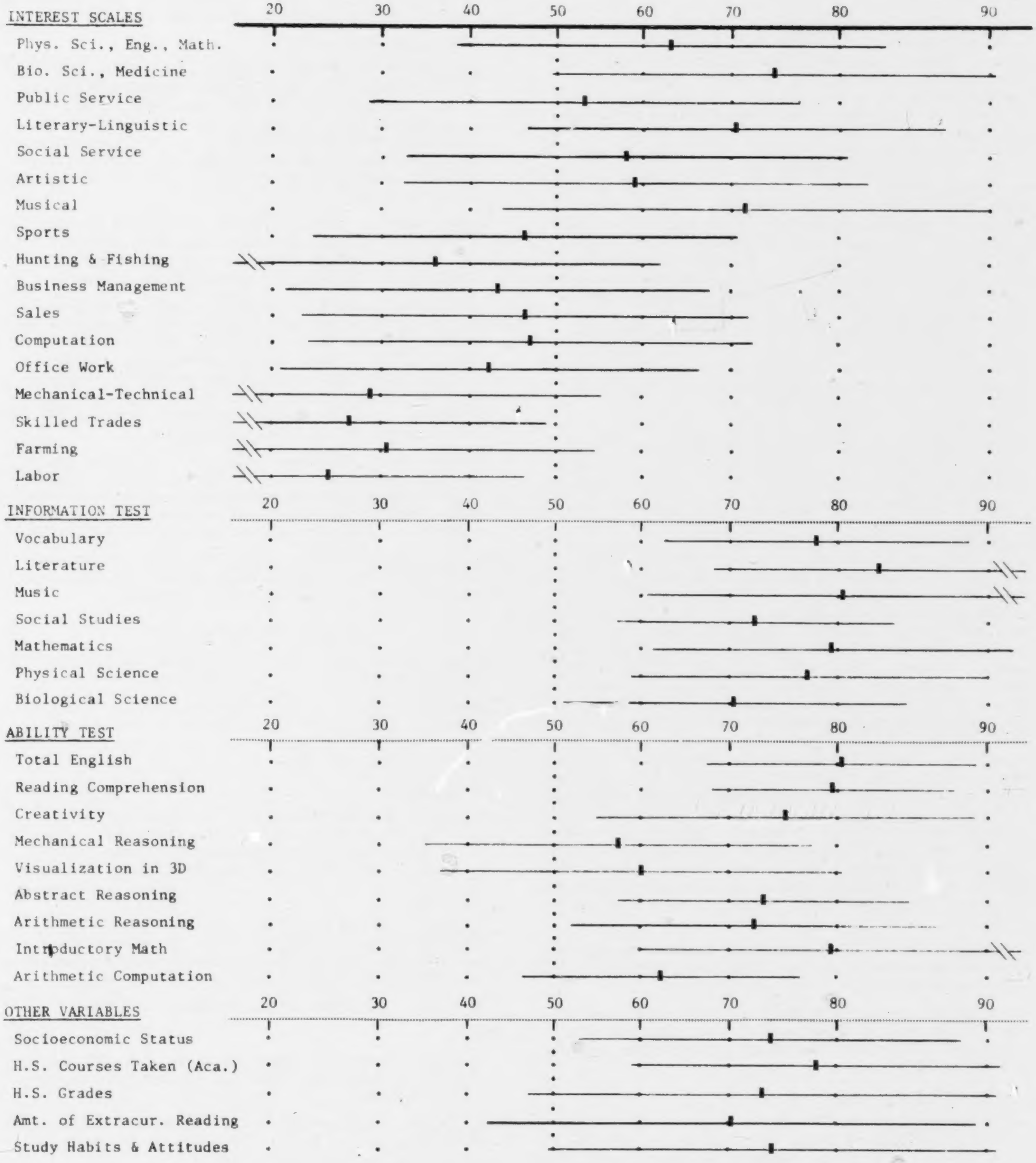
Others

General: High (78th percentile) in academic orientation of courses; low (70th percentile) in extracurricular reading.

Specific: High (73rd percentile) in self-perception of writing skills; 50th percentile in sociability; 67th percentile in social sensitivity, and self-perception of reading skills; 62nd percentile in self-confidence, and maturity.

PSYCHOLOGIST

(Male - n = 294)



SOCIAL SCIENTIST

Importance: Modern social problems make it necessary for us to understand man's nature. Social theories extensively used in government.

Training: For anthropologist (including archaeologist) bachelor's degree sufficient only for temporary positions. Master's degree qualifies for some beginning jobs, but Ph.D. needed for promotion. Should begin field training as undergraduate. For economist, see p. 140. For geographer, need bachelor's degree with geography major. For most research and teaching jobs, graduate training needed, usually Ph.D. for advancement. Higher degrees require field and laboratory work. For historian, should have master's degree; Ph.D. for high level jobs. For some beginning jobs in government, bachelor's degree with history major sufficient. For political scientist, graduate training usually required. With bachelor's may start as trainee, budget analyst, etc. With master's can work in government or research organization. Master's with major in area studies, foreign service useful for government jobs. College jobs usually require completed class work for Ph.D. Sociologist usually needs master's degree; Ph.D. for advancement. Bachelor's adequate for research assistants, interviewers, statisticians. Now need mathematical and statistical skills.

Work Activities: Cultural anthropologist (ethnologist) studies other cultures. Archaeologist reconstructs man's past from material objects. Physical anthropologist studies physical evolution and races. Most anthropologists college and university teachers; some are museum workers, writers, etc. For economist, see p. 140. Geographer studies the earth's, moon's or planets' surface and earth's relation to human life. Usually specializes in a particular branch, as economic, political, physical, lunar geography. Most geographers teach in colleges and universities; many work for federal government and private industry. Historian studies records of the past. Usually specializes in some particular area, period, or human activity (as business or military history). Most employed as college teachers. Some archivists for museums, libraries, historical societies. Political scientist studies government. Usually specializes, as in U. S. political institutions or international relations. Conducts surveys, analyzes work of government agencies. Most employed as college or university teachers. May work for government, research bureaus, business. Sociologist studies humans in groups. Usually specializes, as in rural sociology, population studies, opinion analysis. Studies social problems; work often basis for governmental policy and action. About three-fourths of sociologists college or university teachers. Others work for government, industry, or are self-employed.

Outcomes: Instruction of students in their specialty. Research contributing to knowledge and providing sound basis for policy.

Supervision; Social Relations: Usually supervised by superior or head of department. Good relations with colleagues essential. Social scientists often operate as members of a team.

Salary; Other Benefits:

Anthropologist: In 1970 Ph.D. anthropologists started at $8,000-$10,000 a year. If experienced earned $16,000-$20,000. Those employed by educational institutions earned median salary of $14,000 for academic year, $15,500 for calendar year. In federal service M.A.'s started at $9,881 and Ph.D.'s at $11,905. Salary for experienced anthropologists $14,000-$20,000. Travel and arduous field work often necessary.

Economist: See p. 140.

Geographer: In 1970, beginning geographers with bachelor's degree going to work for federal government started at $6,548 or $8,098. With year or two of graduate teaching experience started at $8,098 or $9,881, with Ph.D. at $11,905. In colleges and universities Ph.D. assistant professors earned at least $11,500, professors often $20,000. In research, travel often necessary.

Historian: In 1970, starting salary with bachelor's degree $6,548; with excellent record or graduate training $8,098. Median salary in federal service about $14,000. In colleges or universities, $12,200.

Political Scientist: In 1970, political scientists with bachelor's degree going to work for federal government started at about $6,500. With superior academic record or year of graduate training, $8,100. With master's degree, political scientists working for educational institutions earned $6,000-$8,500. In educational institutions median salary $12,000 for school year, $15,300 for calendar year.

Sociologist: Beginners with master's degree and superior record working for federal government earned $9,881; experienced sociologists about $11,905-$19,643. Median salary in educational institutions $12,200; in nonprofit organizations and industry $11,905-$19,643.

Role of Sexes: In 1970, about one-fifth of anthropologists women; about 15% of geographers. Of the social scientist group as a whole, about 10% women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (65th percentile) in natural sciences, public service, and literary-linguistic; lowest (35th percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around the 73rd percentile on information scores; highest (76th percentile) in literature, music, and mathematics; lowest (63rd percentile) in vocabulary, and biological science.

Abilities

General: Around the 68th percentile on ability scores; highest (80th percentile) in introductory mathematics; lowest (52nd percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 72nd percentile in memory for words.

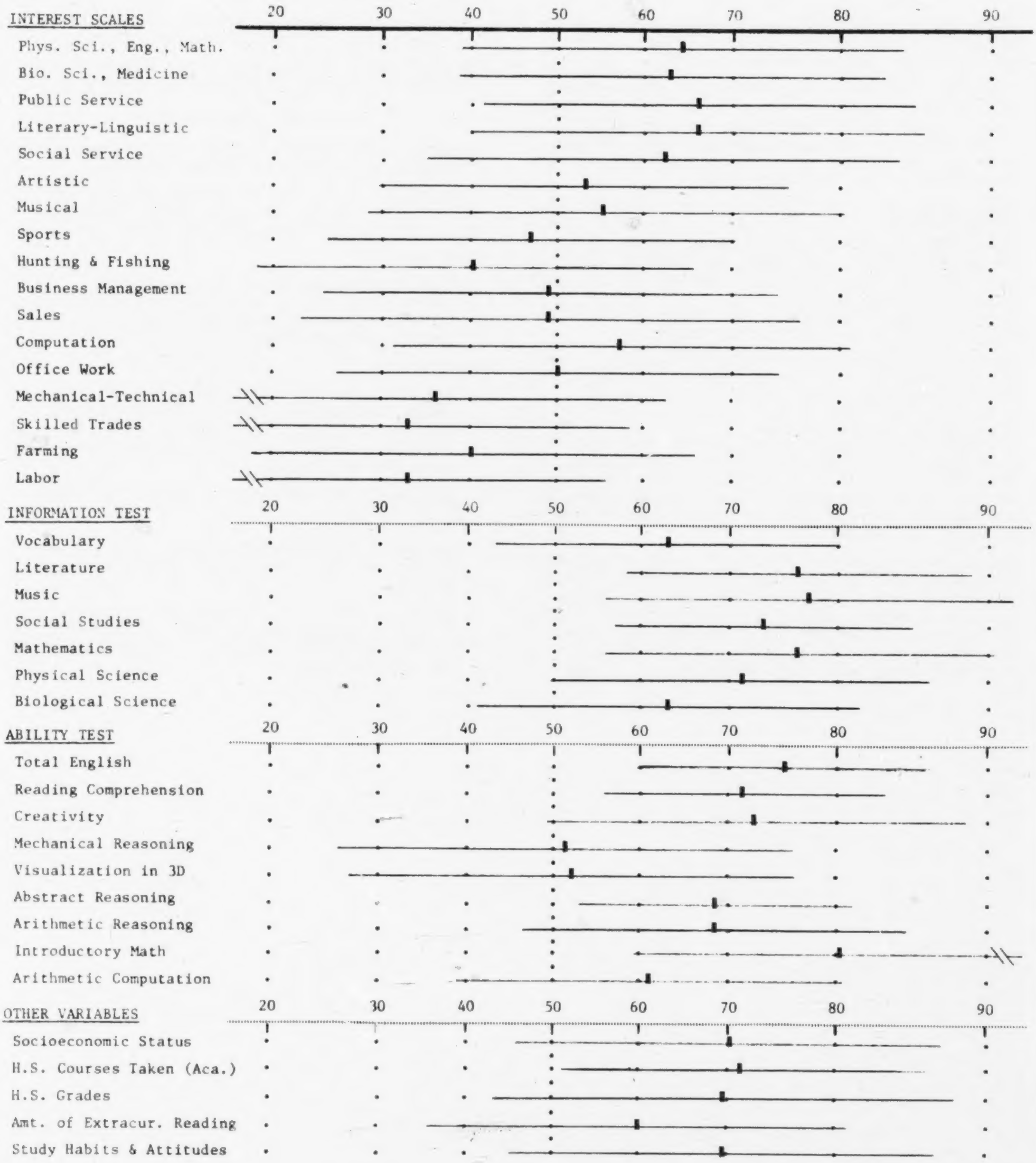
Others

General: High (71st percentile) in academic orientation of courses; low (60th percentile) in extracurricular reading.

Specific: 55th percentile in sociability; 62nd percentile in social sensitivity, and self-perception of writing and reading skills.

SOCIAL SCIENTIST

(Male - n = 85)



TEACHER - College (not elsewhere classified)

Importance: Strong influence on young adults who are preparing to enter the professional class; ability to further human knowledge by research.

Training: Bachelor's degree nearly always required; M.A. or Ph.D. usually essential except for instructors doing graduate work. Some states require teaching certificates for teachers in public 2-year colleges. Applicant for college or university teaching must have specialized in one particular field.

Work Activities: Gives lectures; leads seminars and discussion groups, directs research. Prepares teaching materials; keeps records of students' progress. May do research, publish books and articles, give outside lectures, supervise assistants, act as consultant to business or government. Must keep up with field he is teaching by continuous reading and study. Publication usually necessary for promotion.

Outcomes: Students educated in the field being taught and with some acquaintance with research methods; books, articles, and other research in teacher's field.

Supervision; Social Relations: A college or university teacher is supervised by his immediate superior, who is usually the head of the department specializing in the subject in which he is teaching. Also supervised by the college administration. Must maintain good relations with these persons, with other faculty members, and with his students.

Salary; Other Benefits: In 1969-70 teachers in public 2-year colleges had median salaries of about $10,850; those in non-public 2-year colleges $8,190. Median salaries in 4-year colleges were $8,416 for an instructor or lecturer; $10,698 for an assistant professor, $12,985 for an associate professor, and $16,799 for a full professor. Many fringe benefits such as long vacations, insurance, sabbatical years (one year off in seven), free tuition for children, travel, etc.

Role of Sexes: Both men and women work as college and university teachers, but the majority are men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (75th percentile) in literary-linguistic and music; lowest (30th percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around 81st percentile on information scores; highest (82nd percentile) in vocabulary, literature, music, and mathematics; lowest (74th percentile) in biological science.

Abilities

General: Around the 76th percentile on ability scores; highest (86th percentile) in English; high (80th percentile) in mathematics; lowest (64th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 77th percentile in memory for words.

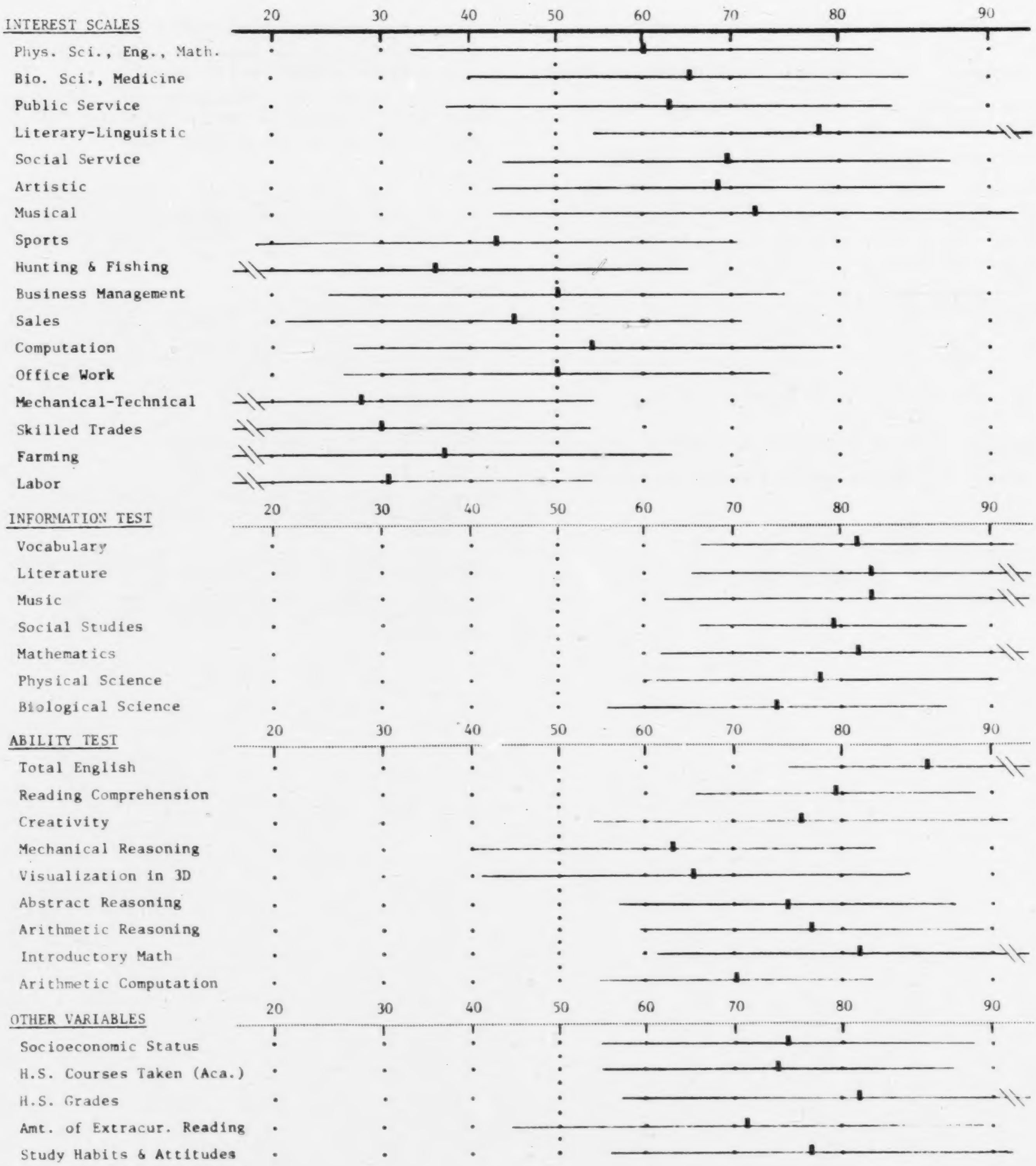
Others

General: High (81st percentile) in high school grades; low (71st percentile) in extracurricular reading.

Specific: High (75th percentile) in self-perception of writing and reading skills; 52nd percentile in sociability; 66th percentile in social sensitivity, and self-confidence.

TEACHER - College (not elsewhere classified)

(Male - n = 571)



TEACHER - College English

(For information on college teachers in general, see p. 152.)

Importance: Teaches appreciation of English and American literature, gives student a sense of the cultural past, enables him to express himself in writing more fully and accurately.

Training: Bachelor's degree with major in English usually qualifies only for part-time teaching assistantship. Master's usually necessary for full-time job; Ph.D. usually needed for advancement. Training in research methods advisable since research also required for advancement. A few persons are appointed to faculty status on the basis of original writing or their standing in the literary world.

Work Activities: Usually specializes in particular authors, authors of a particular country, or a particular period of literary history. Conducts classes, leads seminars and discussion groups, confers with students, gives tests, evaluates themes, supervises graduate assistants. Does research with view to publication.

Outcomes: Students adequately instructed in English expression and in English and American literature; research that makes a contribution to existing knowledge.

Supervision; Social Relations: See p. 152.

Salary; Other Benefits: See p. 152.

Role of Sexes: Both men and women are college teachers of English.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (88th percentile) in literary-linguistic; lowest (18th percentile) in office work.

Similar to: Teacher/English--High School

Information

General: Average around 88th percentile on information scores; highest (92nd percentile) in literature; high (91st percentile) in vocabulary, and mathematics; low (85th percentile) in biological science.

Abilities

General: Around 81st percentile on ability scores; highest (92nd percentile) in English, and reading comprehension; high (90th percentile) in introductory math; low (75th percentile) in three-dimensional visualization, abstract reasoning, and arithmetic computation.

Specific: High (88th percentile) in word functions; 81st percentile in memory for words.

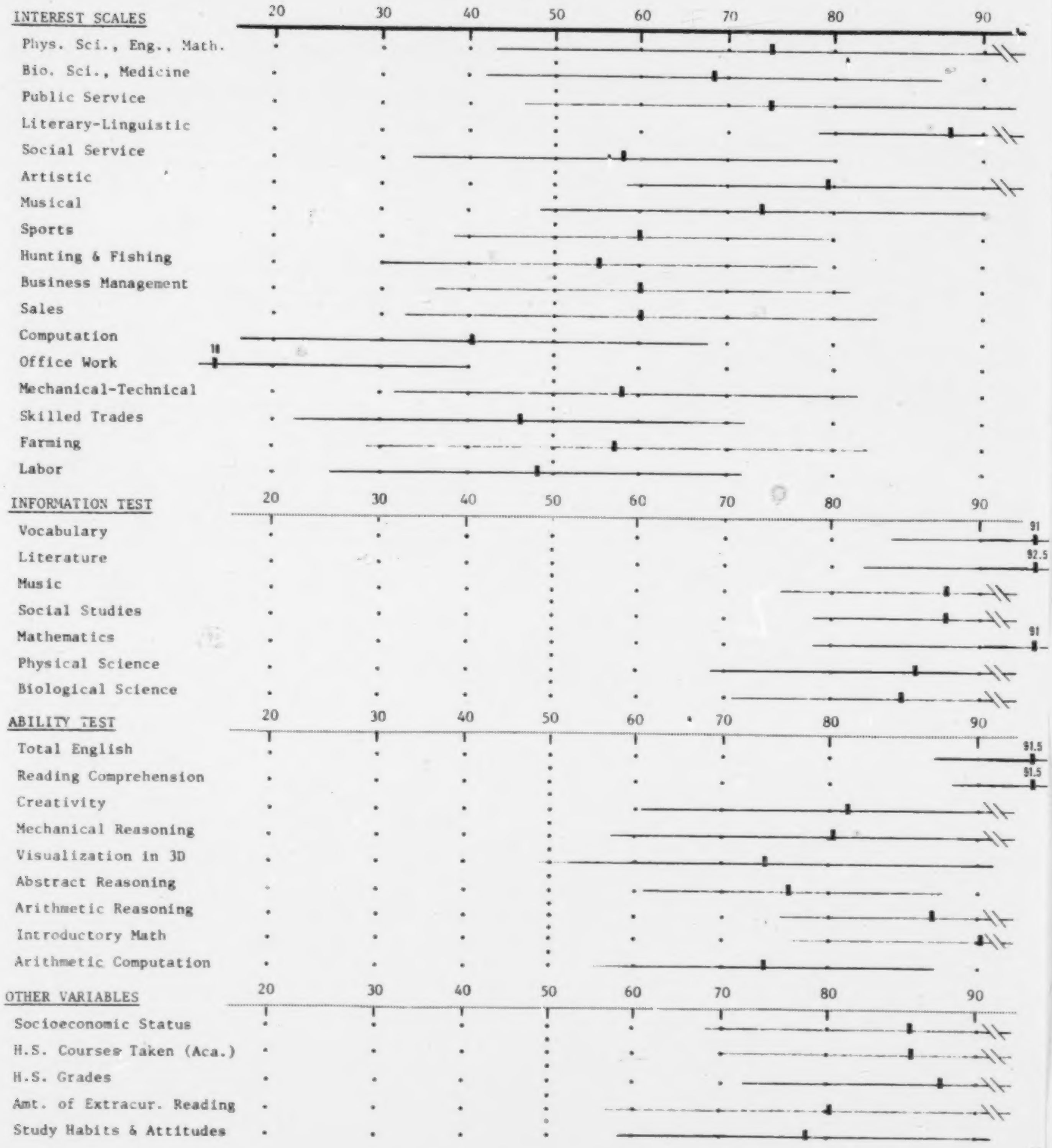
Others

General: High (88th percentile) in high school grades; low (78th percentile) in study habits and attitudes.

Specific: High (83rd percentile) in self-perception of writing skills; 80th percentile in self-perception of reading skills; 42nd percentile in sociability; 64th percentile in social sensitivity, and self-confidence.

TEACHER - College English

(Female - n = 140)



TEACHER - High School English

Importance: Develops communications skills, oral and written, needed in social and occupational life.

Training: Same as for high-school teachers in general (see p. 126), except that English should be studied as a major.

Work Activities: Teaches classes in communication skills, literature, etc. Plans future lessons and prepares learning materials. Keeps records of students' progress. Conducts extracurricular activities in areas related to English. May also teach an additional field such as social studies.

Outcomes: Students able to communicate easily and accurately, who read with good comprehension and who appreciate and are able to understand literature in the English language.

Supervision; Social Relations: The same as for high-school teachers in general (see p. 126).

Salary; Other Benefits: About the same as for high-school teachers in general (see p. 126).

Role of Sexes: Both men and women employed as high-school English teachers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (78th percentile) in literary-linguistic; lowest (25th percentile) in office work.

Similar to: Teacher/English--College

Information

General: Average around 81st percentile on information scores; highest (85th percentile) in literature, and mathematics; lowest (76th percentile) in biological science.

Abilities

General: Around the 76th percentile on ability scores; highest (83rd percentile) in English, reading comprehension, and mathematics; lowest (66th percentile) in arithmetic computation.

Specific: 76th percentile in memory for words; high (81st percentile) in word functions.

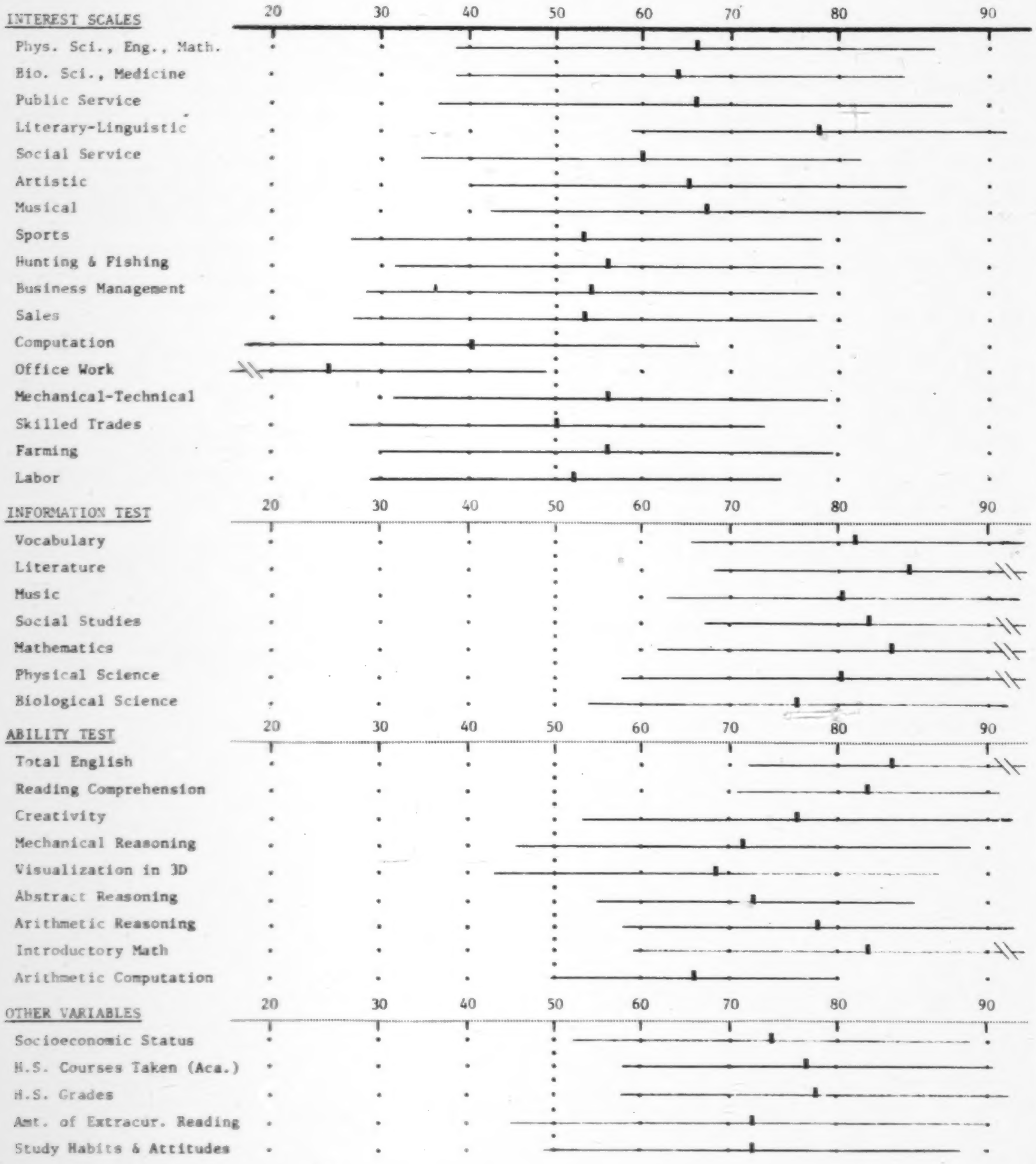
Others

General: High (78th percentile) in high school grades; low (72nd percentile) in extracurricular reading, and study habits and attitudes.

Specific: High (78th percentile) in self-perception of writing skills; 72nd percentile in self-perception of reading skills; 45th percentile in sociability; 61st percentile in social sensitivity, and self-confidence.

TEACHER - High School English

(Female - n = 465)



TEACHER - College Foreign Language

(For information on college teachers in general, see p. 152.)

Importance: High school language training usually inadequate for fluency. Many students have not had languages in high school, but some degrees and some careers demand a knowledge of languages.

Training: College education usually necessary, advanced degrees helpful, but knowledge of language taught, literature in that language, and cultural background of its country are requisites. Need to learn techniques of language laboratory, use of tape recorders, cassettes, etc. Most language teachers find it necessary to refresh their knowledge periodically with frequent travel.

Work Activities: Teaches classes in language, cultural history of countries speaking it, foreign literature. Confers with students, leads language clubs, "Spanish houses," etc. Supervises graduate assistants. May manage language laboratory, operate devices for the reproduction of sound, teaching machines. May give examinations to certify applicant's facility in foreign language. Usually specializes in some one language.

Outcomes: Students able to speak, read, and/or write a foreign language, with knowledge of culture and country that produced it.

Supervision; Social Relations: If graduate assistant, supervised by teacher he is assisting; otherwise supervised by head of department.

Salary; Other Benefits: See p. 152.

Role of Sexes: Both men and women are college instructors in foreign language.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (70th percentile and above) in physical science, engineering and mathematics, literary-linguistic, artistic, and musical; lowest (16th percentile) in office work.

Similar to: Teacher/Foreign Language--High School

Information

General: Average around 88th percentile on information scores; highest (90th percentile and above) in literature, social studies, and mathematics; lowest (79th percentile) in biological science.

Specific: 82nd percentile in foreign travel.

Similar to: Teacher/Foreign Language--High School except for profile level.

Abilities

General: Around the 83rd percentile on ability scores; highest (90th percentile) in English, and introductory mathematics; lowest (71st percentile) in three-dimensional visualization.

Specific: High (89th percentile) in word functions; 82nd percentile in memory for words.

Similar to: Teacher/Foreign Language--High School except for profile level.

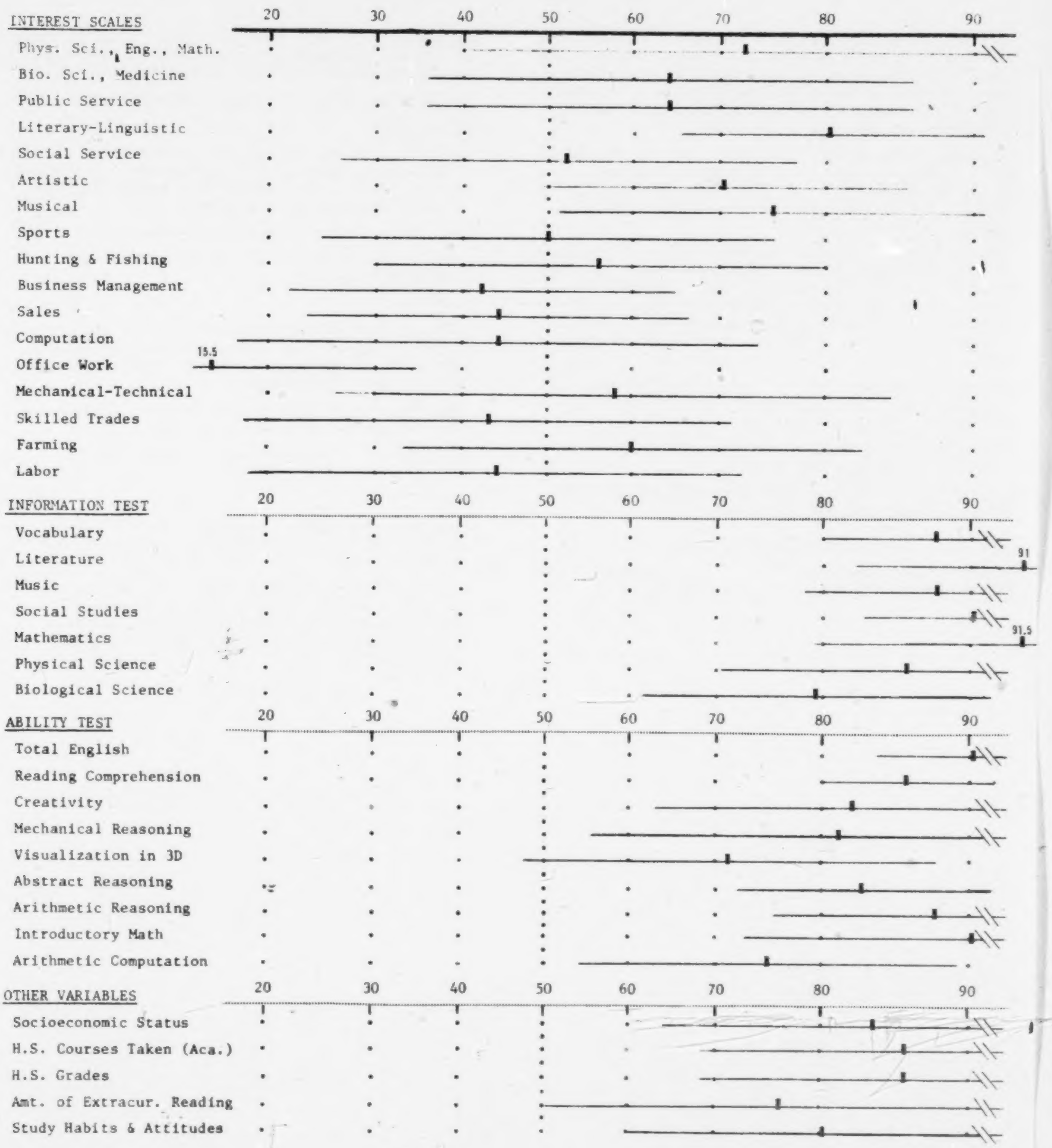
Others

General: High (86th percentile) in academic orientation of courses, and grades; low (76th percentile) in extracurricular reading.

Specific: High (81st percentile) in self-perception of writing skills; 39th percentile in sociability; 63rd percentile in social sensitivity, and self-confidence; 72nd percentile in self-perception of reading skills.

TEACHER - College Foreign Language

(Female - n = 68)



TEACHER - High School Foreign Language

Importance: Language differences one of the main barriers to international understanding. Students who learn a foreign language better able to understand other cultures in countries where they work or travel. Language courses also include information on history and culture of countries concerned.

Training: Same as for high-school teachers in general (see p. 126); except that studies should include a foreign language major and enough practical experience (travel, etc.) to enable teacher to speak, read, and write the language taught.

Work Activities: Teaches classes in foreign language; prepares materials for and plans future classes; keeps records of students' progress. Uses tape-recorders, records, cassettes, and language-laboratory equipment. Maintains own facility in foreign language by study and travel. May supervise extracurricular language clubs.

Outcomes: Students able to read, write, or speak a foreign language and acquainted with foreign culture, literature, and thought patterns.

Salary; Other Benefits: About the same as for other high-school teachers (see p. 126).

Role of Sexes: Both men and women employed as high-school foreign-language teachers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (67th percentile) in physical science, engineering and mathematics, and literary-linguistic; lowest (26th percentile) in office work.

Similar to: Teacher/Foreign Language--College

Information

General: Average around 82nd percentile on information scores; highest (87th percentile) in literature, social studies, and mathematics; lowest (73rd percentile) in biological science.

Specific: 75th percentile in foreign travel.

Similar to: Teacher/Foreign Language--College except for profile level.

Abilities

General: Around the 75th percentile on ability scores; highest (87th percentile) in English, and introductory mathematics; lowest (63rd percentile) in arithmetic computation.

Specific: High (84th percentile) in word functions; 79th percentile in memory for words.

Similar to: Teacher/Foreign Language--College except for profile level.

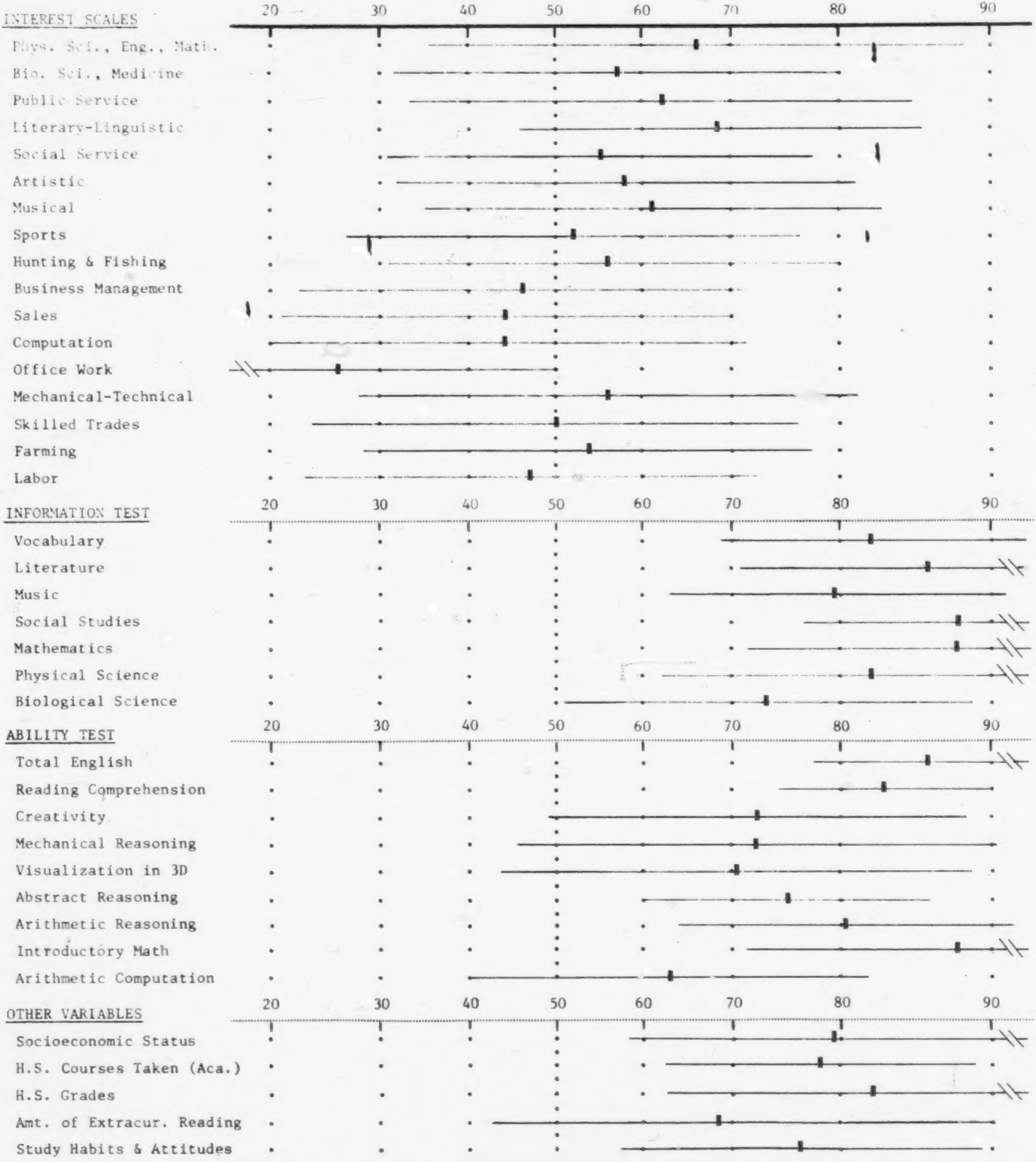
Others

General: High (82nd percentile) in high school grades; low (68th percentile) in extracurricular reading.

Specific: High (74th percentile) in self-perception of writing skills; 44th percentile in sociability; 57th percentile in social sensitivity, and self-confidence; 64th percentile in self-perception of reading skills.

TEACHER - High School Foreign Language

(Female - n = 172)



TEACHER - College Social Science

Importance: Study of human relationships particularly necessary in modern world; college teachers have strong influence on opinions and attitudes of young adults who will later be influential.

Training: Same as for college and university teachers in general (see p. 152), but Ph.D. particularly important in this field.

Work Activities: Same as for college and university teachers in general (see p. 152). Anthropologists study the origin, characteristics, social relationships, culture, etc. of man. Archaeologists use material artifacts of man to learn about past societies; may study man through his languages. Physical anthropologists study man's evolution and racial and hereditary characteristics. Economists study the economic system, man's use of land, resources, and labor, unemployment, the money supply, and the results of various economic policies. Geographers study the earth, its structure, climate, and peoples. Historians study the past. Political scientists study government. Sociologists study man as part of a social group.

College teachers of these subjects also do research in them.

See Social Scientist, p. 150.

Outcomes: Same as for college and university teachers in general (see p. 152).

Supervision; Social Relations: Same as for college and university teachers in general (see p. 152).

Salary; Other Benefits: About the same as for college and university teachers in general (see p. 152).

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (82nd percentile) in literary-linguistic; high (69th percentile) in biological science and medicine, public service, social service, and musical; very low (24th percentile) in mechanical-technical, skilled trades, and labor.

Information

General: Average around 83rd percentile on information scores; highest (87th percentile) in literature, and social studies; lowest (72nd percentile) in biological science.

Specific: 80th percentile in law.

Similar to: Teacher/Social Sciences and Studies--High School except for profile level.

Abilities

General: Around the 75th percentile on ability scores; high (84th percentile) in English, and reading comprehension; low (55th percentile) in mechanical reasoning.

Specific: 75th percentile in memory for words.

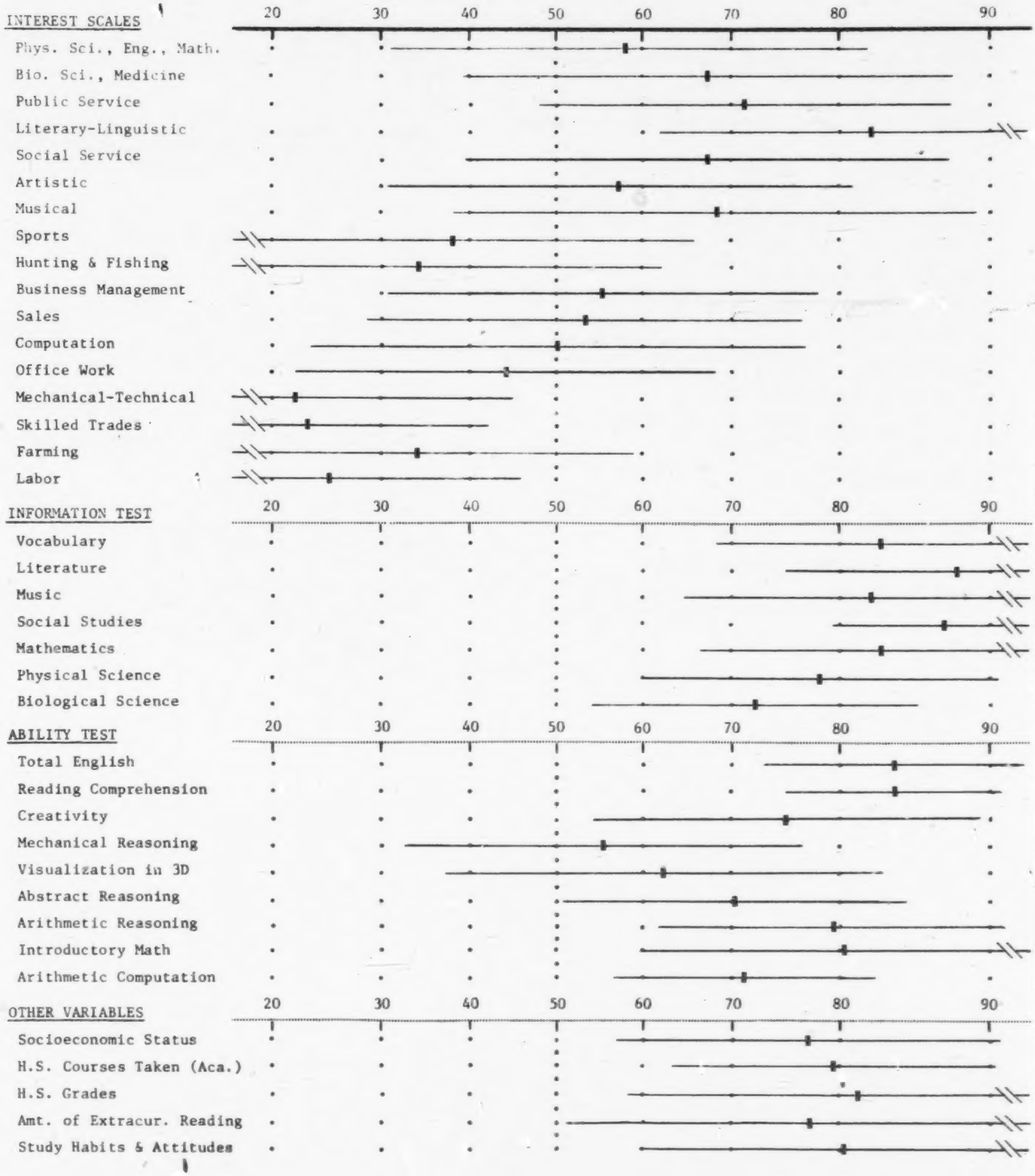
Others

General: High (81st percentile) in high school grades; low (77th percentile) in socioeconomic status, and extracurricular reading.

Specific: High (78th percentile) in self-perception of writing and reading skills; 44th percentile in sociability; 63rd percentile in social sensitivity, and self-confidence.

TEACHER - College Social Science

(Male - n = 234)



TEACHER - High School Social Studies

Importance: Social studies teacher moulds opinion on matters of citizenship and public affairs; gives student picture of world outside his limited segment of time and space.

Training: Same as for secondary school teachers in general (see p. 126), preferably with major in social studies.

Work Activities: Teaches classes in citizenship, history, economics, sociology, earth science, etc. Prepares teaching materials, plans future classes. Keeps records of student's progress. Often conducts extracurricular activities relating to social studies. May teach classes in another field, such as English, in addition to social studies.

Outcomes: Students indoctrinated with current social ideals, aware of the mechanisms of government and capable of taking part in the functions of citizenship. Development of interest in current problems and their solutions. Knowledge of the past and ability to apply its lessons to modern situations.

Supervision; Social Relations: Same as for other secondary-school teachers; see p. 126.

Salary; Other Benefits: About the same as for other secondary-school teachers; see p. 126.

Role of Sexes: Both men and women employed as high-school social-studies teachers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (69th percentile) in literary-linguistic, and social service; lowest (36th percentile) in hunting and fishing, mechanical-technical and skilled trades.

Information

General: Average around 67th percentile on information scores; highest (73rd percentile) in literature, and social studies; lowest (62nd percentile) in biological science.

Specific: 68th percentile in law.

Similar to: Teacher/Social Sciences and Studies--College except for profile level.

Abilities

General: Around the 61st percentile on ability scores; highest (67th percentile) in English, and reading comprehension; lowest (48th percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: 66th percentile in memory for words.

Similar to: Teacher/Social Sciences and Studies--College except for profile level.

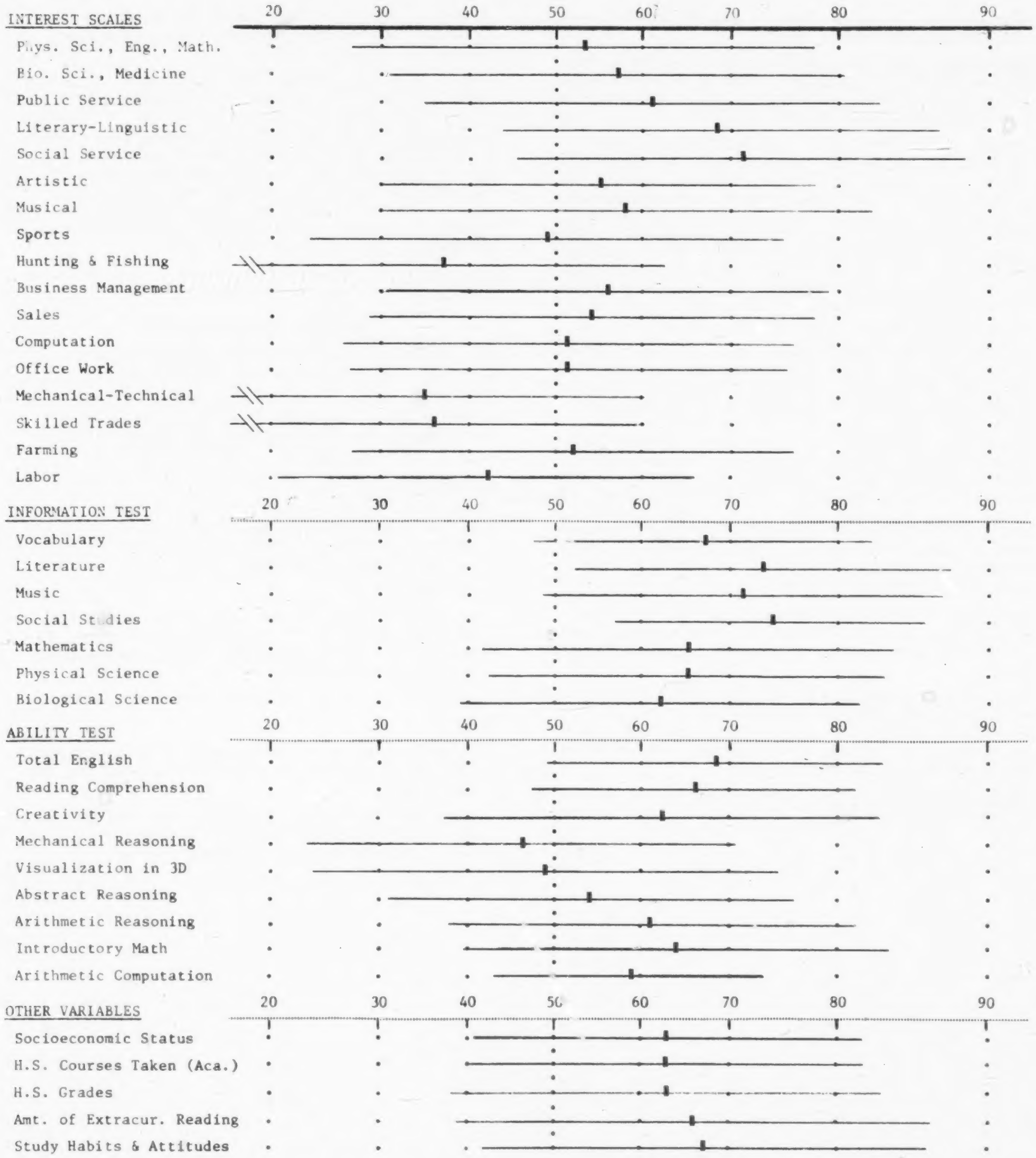
Others

General: High (67th percentile) in study habits and attitudes; low (63rd percentile) in socioeconomic status, academic orientation of high school courses, and grades.

Specific: High (64th percentile) in social sensitivity, and self-perception of writing and reading skills; 52nd percentile in sociability, and self-confidence.

TEACHER - High School Social Studies

(Male - n = 254)



WRITER

(For information on the work of journalists and newspaper reporters, see p. 142.)

Importance: Written materials one of the forces that bind modern society together. One of the major means of conveying ideas. Some written materials serve for entertainment; others for instruction.

Training: No formal education required for most writers, but should have equivalent of a college education. In school should study writing, English, and literature. For technical writers, college education with courses in writing and scientific and technical subjects demanded by some employers, degrees in engineering by others, degrees in English or journalism by others. Some schools now offer courses and degrees in technical writing. High-school students planning to be technical writers should take courses in science, mathematics, and English; work on school paper.

Work Activities: Some writers work on fiction, poetry, books, newspaper and magazine articles, etc., others on textbooks or other utilitarian material. Most self-employed, especially writers of books and magazine articles. Technical writer produces material on scientific and technological subjects, usually for some specific class of readers, such as the users of a particular product. Must research subject, consult scientists and technicians, organize, write, and edit article, get it illustrated, write successive drafts to make it easily understandable. Principal requirement clarity. Most technical writers work for electronics and aerospace industry, some for federal government, some self-employed.

Outcomes: Fiction, poetry, magazine and newspaper articles, books. For technical writer, manuals, publicity releases, technical articles, research proposals, etc.

Supervision; Social Relations: Most writers supervised only by editor. Technical writer usually begins by working as assistant to experienced technical writer. Often works as part of team. Overtime work sometimes necessary to meet deadlines.

Salary; Other Benefits: Income of freelance writers of fiction, poetry, magazine articles, etc. varies widely. Sometimes very high but usually not enough to support a family. Much writing done by people with other sources of income.

Technical writer usually works on salary. In 1970 beginning technical writers with bachelor's degree and about five science courses going to work for federal government started at $6,548 or $8,098; with 2 years' experience at $9,881; with 3 years' experience at $11,905. In private industry beginning technical writers with bachelor's degrees started at $6,000-$8,000; with some experience earned $8,000-$12,000; if highly experienced $12,000-$16,000; in supervisory or management jobs up to $20,000 or over.

Role of Sexes: Women well represented in most types of writing, but most technical writers men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (82nd percentile) in literary-linguistic; high (74th percentile) in artistic, and musical; low (31st percentile) in computation; lowest (20th percentile) in office work.

Information

General: Average around 83rd percentile on information scores; highest (88th percentile) in literature; high (86th percentile) in vocabulary; lowest (79th percentile) in music.

Abilities

General: Around the 78th percentile on ability scores; highest (82nd percentile) in reading comprehension and mathematics; low (54th percentile) in arithmetic computation.

Specific: 71st percentile in memory for words.

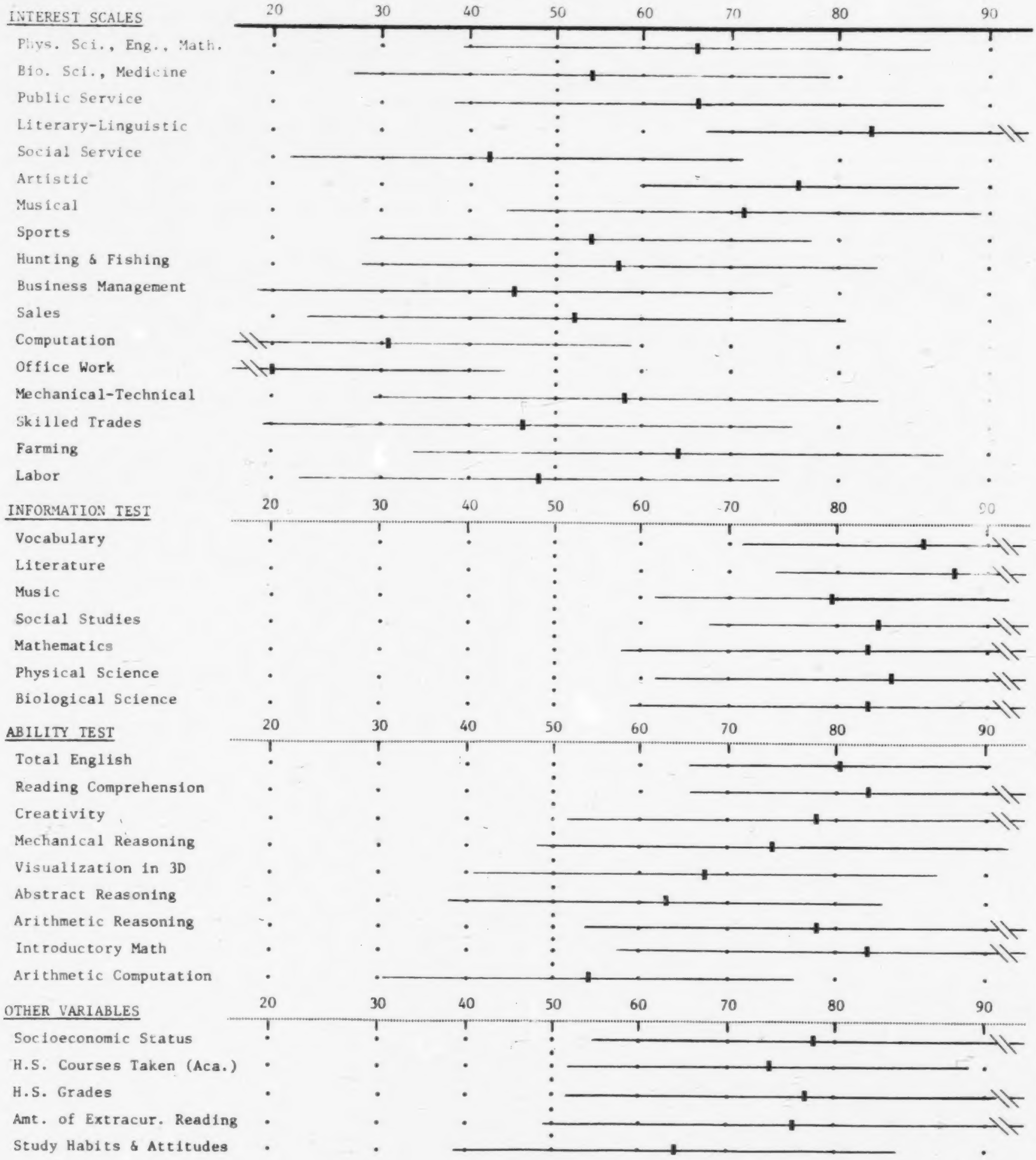
Others

General: High (78th percentile) in socioeconomic status; low (54th percentile) in study habits and attitudes.

Specific: High (77th percentile) in self-perception of writing and reading skills; 61st percentile in social sensitivity, and self-confidence.

WRITER

(Female - n = 99)



CHAPTER 8

CAREER GROUP 6

Fine Arts, Performing Arts

In Career Group 6, we have included the following occupations:

- Artist/Painter, Sculptor, etc. (Females) (a)
- Commercial Artist/Advertising, Fashion, Illustrator, etc. (B)
- Musician/Instrumentalist (C)
- Teacher
  - Art (Females) (d)
  - Music (Females) (e)
- Theater Worker (F)

Occupations in Career Group 6 are related to the arts. Some are in the fine arts: music, sculpture, composition and painting. Some are in the performing arts such as acting, singing, dancing, and playing a musical instrument. Some work as teachers of art or music.

All of these workers are similar in that they have artistic ability. Special training or study is generally necessary to enter one of the occupations in Career Group 6.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (88th percentile) in artistic; high (68th percentile) in musical, and literary-linguistic; lowest (39th percentile) in computation, office work, and labor.

Information

General: Average around 68th percentile on information scores; highest (78th percentile) in music; lowest (62nd percentile) in social studies, and biological science.

Specific: High (75th percentile) in art.

Abilities

General: Around the 68th percentile on ability scores; highest (71st percentile) in English; lowest (45th percentile) in arithmetic computation.

Specific: 62nd percentile in memory for words; 50th percentile in two-dimensional visualization.

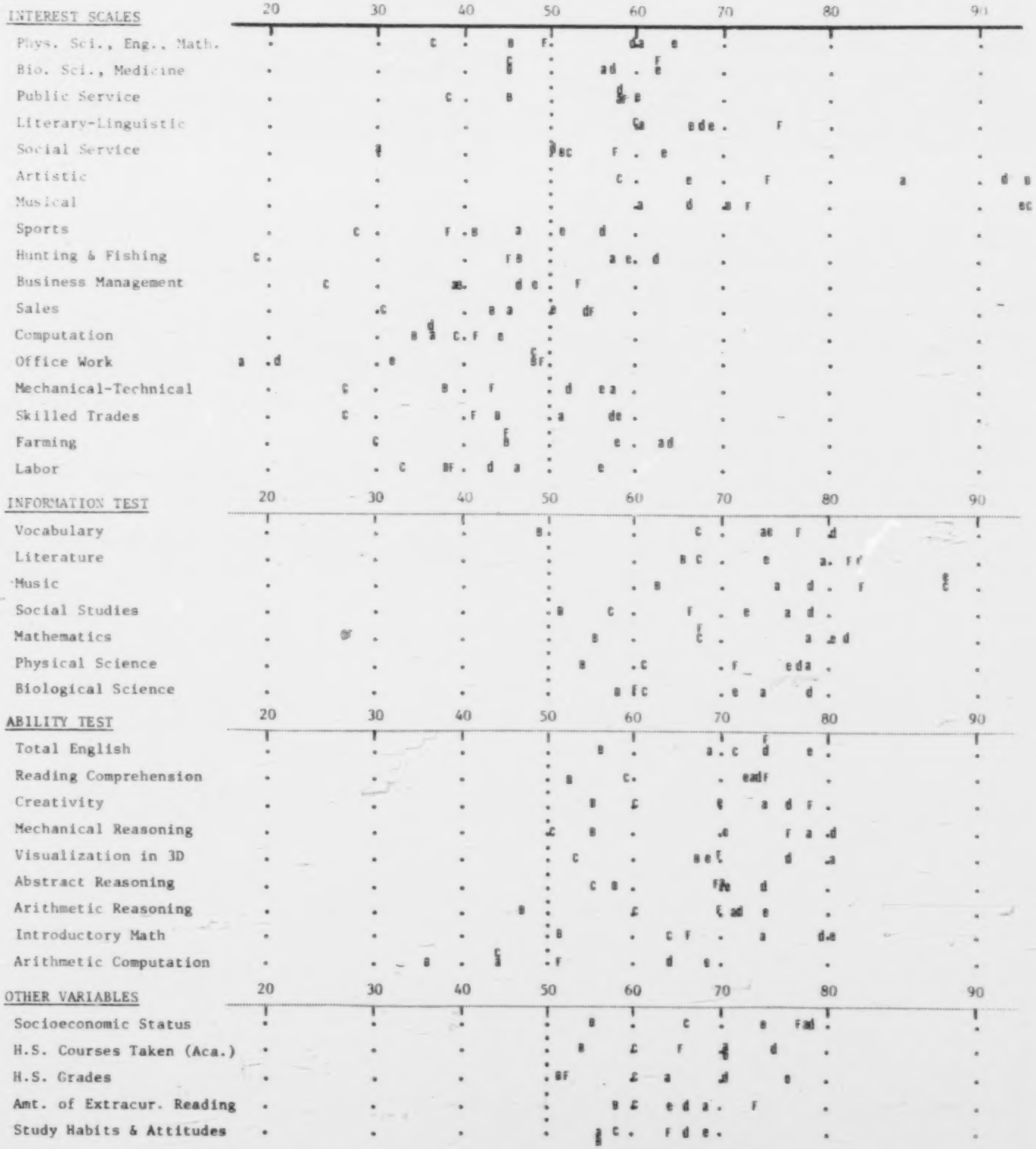
Others

General: High (70th percentile) in socioeconomic status; low (58th percentile) in high school grades, and study habits and attitudes.

Specific: 50th percentile in sociability; 61st percentile in social sensitivity, and self-confidence; 55th percentile in self-perception of reading skills.

CAREER GROUP 6

Fine Arts, Performing Arts



ARTIST, PAINTER, SCULPTOR

Importance: Artists, painters, and sculptors help express and determine the culture of a nation.

Training: May acquire training in high schools and colleges or in special art schools. Some self-taught; others taught by persons already practising their branch of art. Good knowledge of techniques necessary, but no formal educational requirements.

Work Activities: Creation of pictures, sculptures, etc. This often requires a knowledge of materials and the methods of preparing them--grinding pigments for paint, preparing clay for sculpture models, finishing statue after casting, etc. Artist, painter, or sculptor also usually has to be something of a salesman in order to sell his product.

Outcomes: Pictures, paintings, sculptures, etc.

Supervision; Social Relations: No supervision beyond period of learning or apprenticeship. Social relations important in making sales.

Salary; Other Benefits: Artists, painters, and sculptors usually do not make enough to support a family, but those who are successful may have good incomes. Usually no benefits, vacations, etc. For this reason many artists, painters, sculptors, etc. become teachers of their art. However, an advantage of these occupations is the ability to set one's own working hours and, to some extent, place of work.

Role of Sexes: Both men and women are artists, painters, and sculptors.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (85th percentile) in artistic; social service and office work are extreme lows (30th percentile and below).

Information

General: Average around 76th percentile on information scores; highest (79th percentile) in literature; lowest (74th percentile) in vocabulary and biological science.

Specific: High (80th percentile) in art.

Abilities

General: Around the 73rd percentile on ability scores; highest (79th percentile) in mechanical reasoning, and three-dimensional visualization; lowest (44th percentile) in arithmetic computation.

Specific: 78th percentile in two-dimensional visualization.

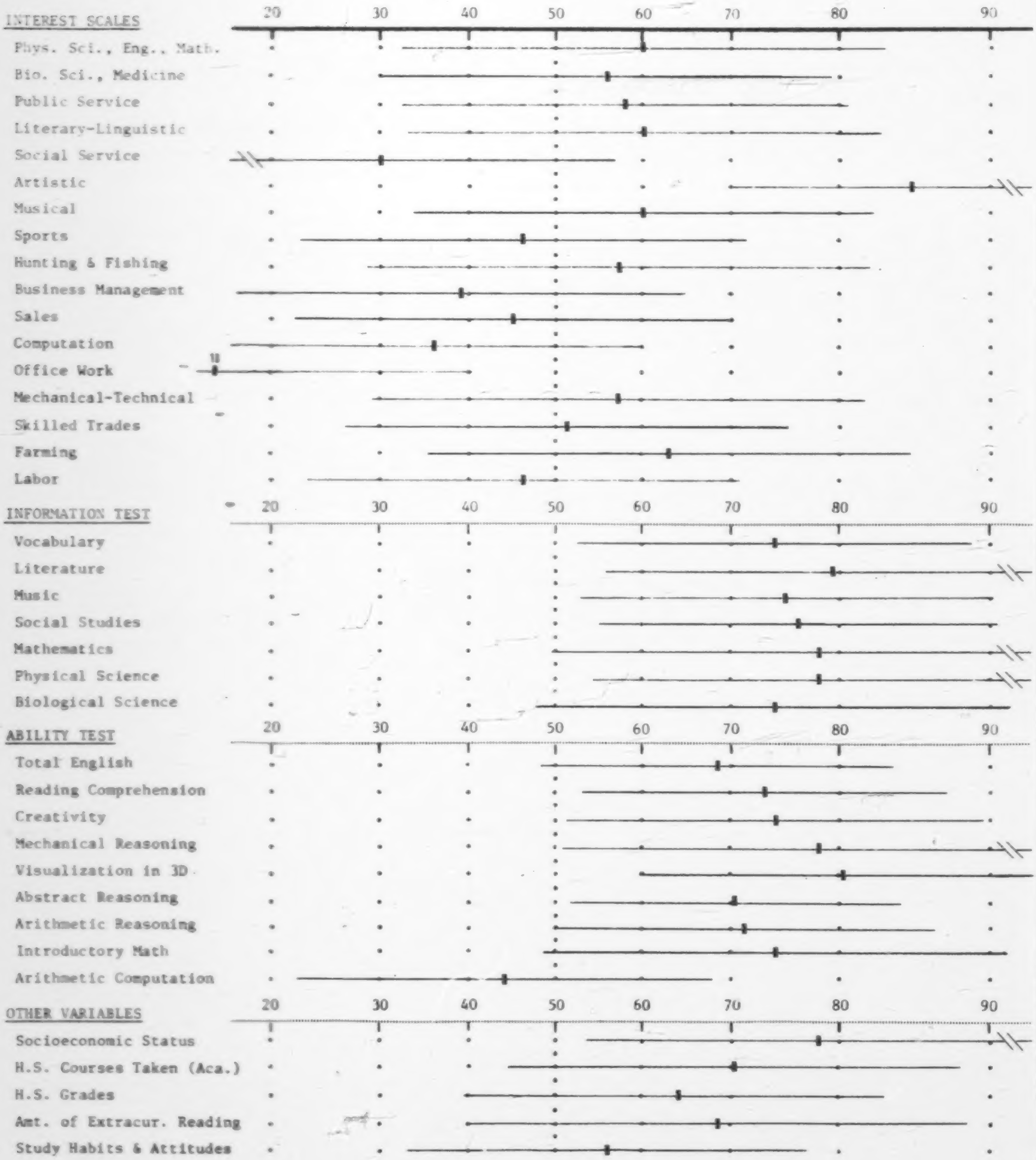
Others

General: High (78th percentile) in socioeconomic status; low (56th percentile) in study habits and attitudes.

Specific: 56th percentile in social sensitivity, and self-confidence.

ARTIST, PAINTER, SCULPTOR

(Female - n = 156)



COMMERCIAL ARTIST - Advertising, Fashion, Illustrator, etc.

Importance: Commercial art helps the economy by assisting in the sale of goods. Enables the customer to learn what is available for sale.

Training: Art school training, 2-4 years beyond high school, desirable. Some training in commercial art available in vocational high school, by correspondence, and on the job. Cultural background useful. Training in drawing from life, advertising design, lettering, color harmony, etc. needed. For art director knowledge of business necessary, along with creativity.

Work Activities: Team of commercial artists often works under art director. Team may include layout artist who arranges advertisement, chooses colors, selects illustrations, etc.; renderers who make rough sketches; letterers; illustrators; and paste-up and mechanical men, who put the various parts of the ad together. General boardmen may do several of these jobs.

Commercial artists also arrange and illustrate magazines, catalogs, greeting cards, and technical drawings.

Some commercial artists do free-lance work.

Outcomes: Graphic material suited to its purpose.

Supervision; Social Relations: Unless free-lancing, commercial artist works under superior at advertising agency, store's advertising department, etc. In large group, team headed by art director.

Salary; Other Benefits: In 1970, beginners started at $70-$75 week if trained in vocational high school, $80 to $85 week if graduate of 2-year art school, $85 to $100 week if graduate of 4-year art school. With experience may earn over $125-$175. Art directors, top illustrators, etc., may earn $15,000-$20,000 year or over.

Role of Sexes: About two-fifths of commercial artists are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (92nd percentile) in artistic; high (68th percentile) in literary-linguistic, and musical; low (34th percentile) in computation; other interests at or below 50th percentile in fairly uniform pattern.

Information

General: Average around 55th percentile on information scores; highest (64th percentile) in literature, and music; lowest (49th percentile) in vocabulary.

Specific: High (74th percentile) in art.

Abilities

General: Around the 55th percentile on ability scores; highest (67th percentile) in three-dimensional visualization; lowest (36th percentile) in arithmetic computation.

Specific: 49th percentile in two-dimensional visualization.

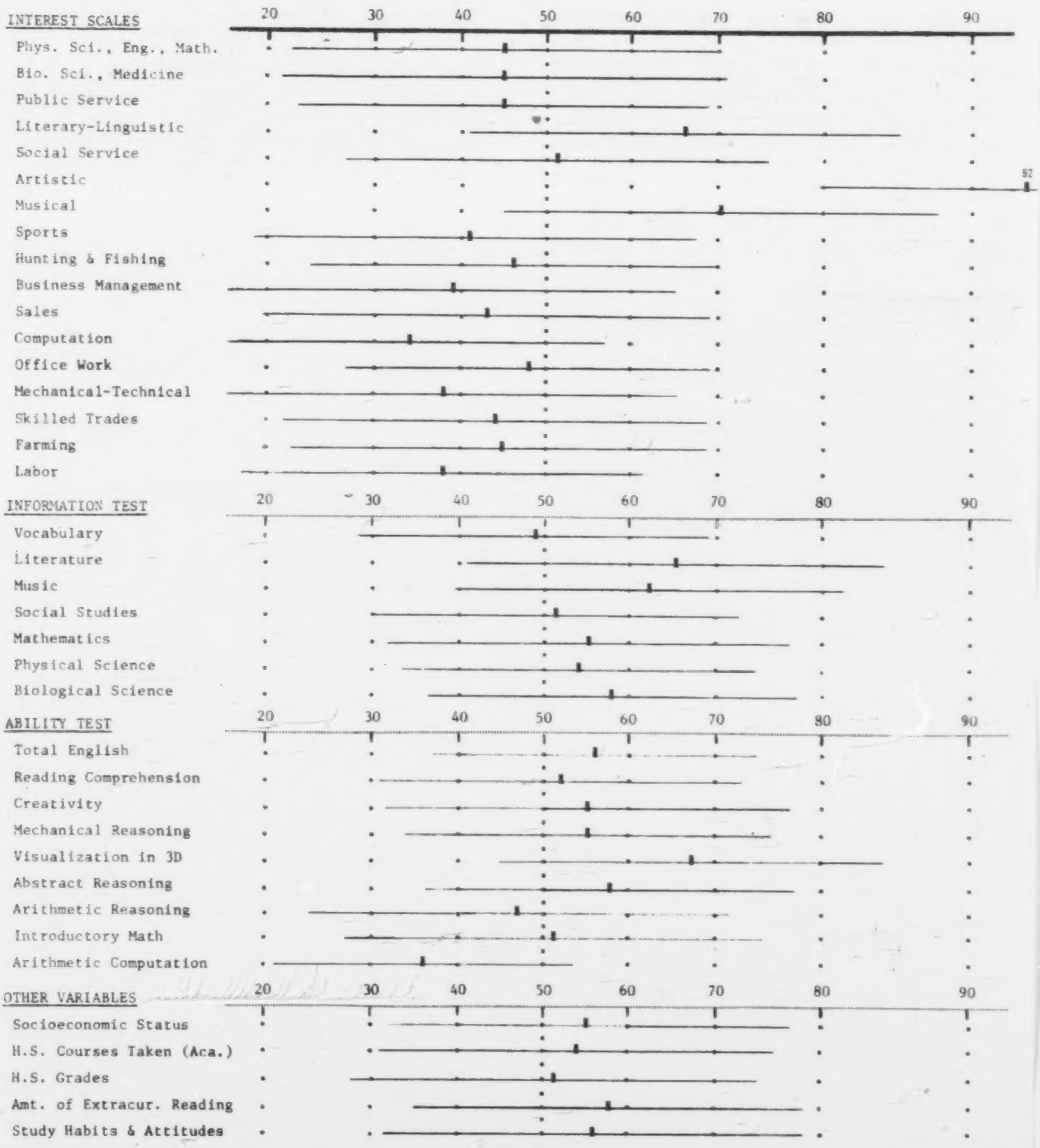
Others

General: High (58th percentile) in extracurricular reading; low (51st percentile) in high school grades.

Specific: High (60th percentile) in social sensitivity.

COMMERCIAL ARTIST - Advertising, Fashion, Illustrator, etc.

(Male - n = 143)



MUSICIAN, INSTRUMENTALIST

Importance: Music an essential part of cultural life. Widely used in broadcasting.

Training: Usually necessary to start study in childhood. Intensive training from private teachers, college school of music, or music conservatory. Continuing study and practice necessary.

Work Activities: Usually specialize in either popular or classical music, as well as in playing some particular instrument. May play alone, in small ensembles, dance bands, or rock groups, or in symphonies. May play at churches, restaurants, etc. Some employed as teachers (see p. 122). Some make recordings; play on radio or television; write music. May be accompanists to singers.

Outcomes: Music, recordings.

Supervision; Social Relations: As member of symphony or musical group, supervised by its leader. As individual or group leader, supervised by employer. If member of group, good social relations with others of group necessary.

Salary; Other Benefits: Members of major symphony orchestras had minimum salaries of from about $5,100 a year to about $16,500 a year in 1970. Largest six orchestras pay $10,900 to $16,500. Members of dance bands $60 to $300 a week. Engagements usually short; much unemployment. Some not constantly enough employed for unemployment compensation. Usually lack sick leave and vacation pay.

Role of Sexes: Both men and women work as musicians, but great majority of band and symphony members men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (93rd percentile) in musical; high (59th percentile) in literary-linguistic, and artistic; lowest (19th percentile) in hunting and fishing.

Information

General: Average around 67th percentile on information scores; extremely high (88th percentile) in music; lowest (57th percentile) in social studies.

Abilities

General: Around the 59th percentile on ability scores; highest (71st percentile) in English; lowest (44th percentile) in arithmetic computation.

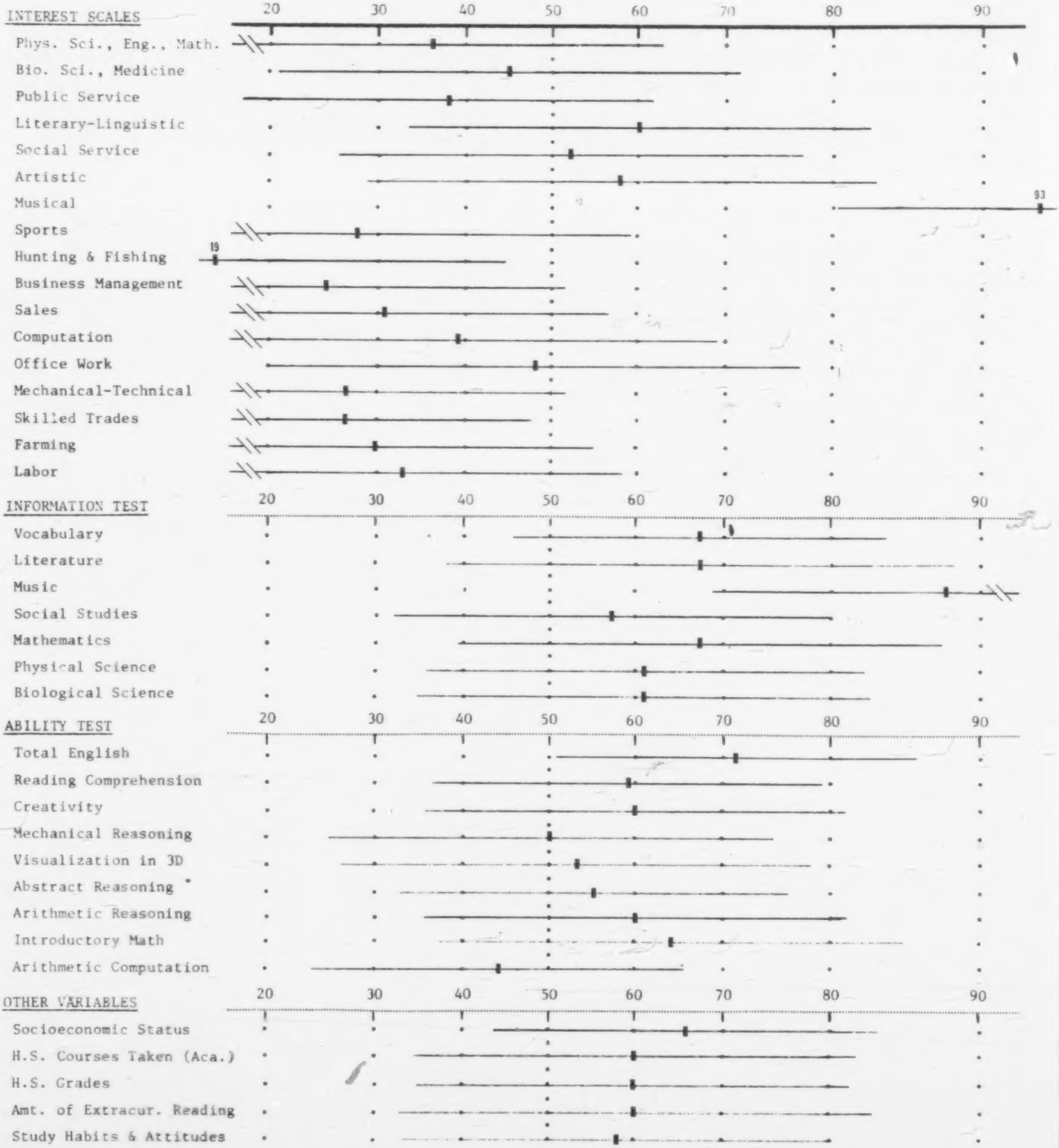
Others

General: High (66th percentile) in socioeconomic status; low (58th percentile) in study habits and attitudes.

Specific: 65th percentile in social sensitivity; 54th percentile in sociability.

MUSICIAN, INSTRUMENTALIST

(Male - n = 63)



TEACHER - Art

Importance: Teaches the principles and techniques of artistic production to students who hope to become professional artists or to practice art as an avocation; teaching art appreciation to students in general.

Training: For art teachers in the public schools the requirements are usually the same as for public-school teachers in general. (See pp. 126 and 124.) May be additional requirement of training in art or courses in the teaching of art.

For teacher giving private lessons in art, no formal requirements.

For either public or private school teacher, history of some success in selling artistic productions is helpful.

Work Activities: Gives classes or, in the case of non-school art teachers, sometimes private lessons, to students who want to learn one of the arts. Teaches techniques and principles of the arts. Gives art appreciation courses for students who do not intend to be artists. Prepares exhibitions.

Outcomes: Students able to practice one or more of the arts, either professionally or for recreation, and students who enjoy and understand artistic productions.

Supervision; Social Relations: Same as for teachers in general.

Salary; Other Benefits: For school-employed art teachers, same as for teachers in general. For non-school-employed art teachers, varying.

Role of Sexes: Both men and women are employed as art teachers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (91st percentile) in artistic; high (67th percentile) in literary-linguistic, and musical; very low (21st percentile) in office work.

Information

General: Average around the 78th percentile on information scores; highest (82nd percentile) in literature; lowest (77th percentile) in physical science.

Specific: High (88th percentile) in art, and architecture.

Abilities

General: Around the 74th percentile on ability scores; highest (80th percentile) in mechanical reasoning, and introductory math; lowest (64th percentile) in arithmetic computation.

Specific: High (73rd percentile) in memory for words; 64th percentile in two-dimensional visualization.

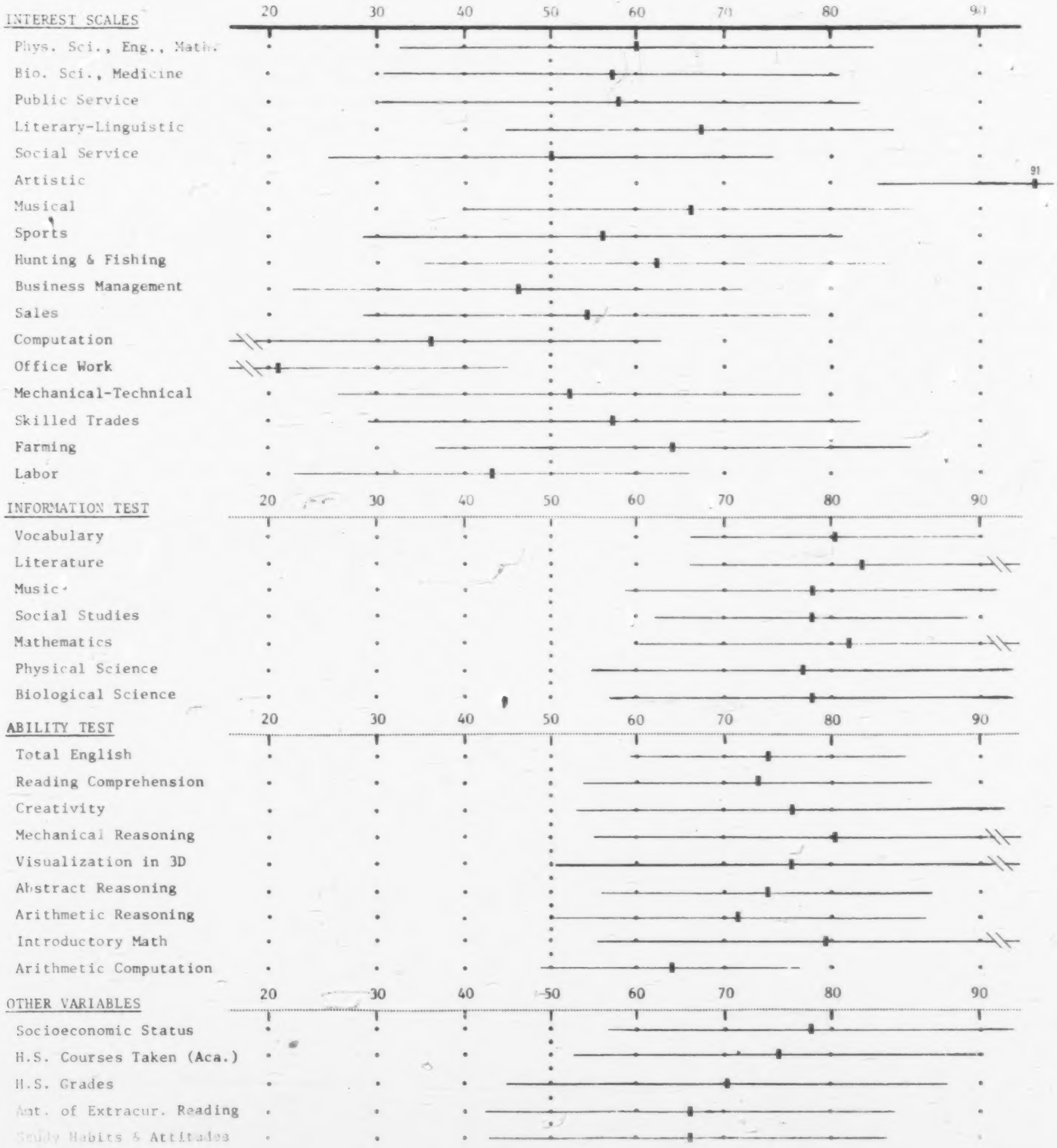
Others

General: High (78th percentile) in socioeconomic status; low (66th percentile) in extracurricular reading, and study habits and attitudes.

Specific: 42nd percentile in sociability; 51st percentile in social sensitivity; 58th percentile in self-confidence, and self-perception of reading skills.

TEACHER - Art

(Female - n = 167)



TEACHER - Music

Importance: Passes on the ability to produce and to enjoy music.

Training: Private study or taking courses at college school of music or music conservatory. These often have high standards of admission and require auditions. With bachelor's degree in music education become eligible for public-school teaching. Higher degrees usually required for college teaching. No formal requirements for non-school teaching.

Work Activities: School music teachers direct musical and choral programs, direct band, give class instruction in playing various instruments and singing, and teach music appreciation. Non-school music teachers usually give private lessons.

Outcomes: Students trained in the production and appreciation of music.

Supervision; Social Relations: For school music teachers, same as for teachers in general (see pp. 126 and 124). Non-school music teachers supervised by persons paying for the lessons.

Salary; Other Benefits: For school music teachers, same as for teachers in general (see pp. 126 and 124). Non-school music teachers dependent on fees which vary with circumstances.

Role of Sexes: Both men and women work as music teachers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (92nd percentile) in musical; high (67th percentile) in literary-linguistic, and artistic; lowest (32nd percentile) in office work.

Information

General: Average around 74th percentile on information scores; very high (88th percentile) in music; lowest (72nd percentile) in social studies, and biological science.

Abilities

General: Around the 72nd percentile in ability scores; highest (80th percentile) in introductory mathematics, and English; lowest (68th percentile) in three-dimensional visualization, and arithmetic computation.

Specific: 71st percentile in memory for words.

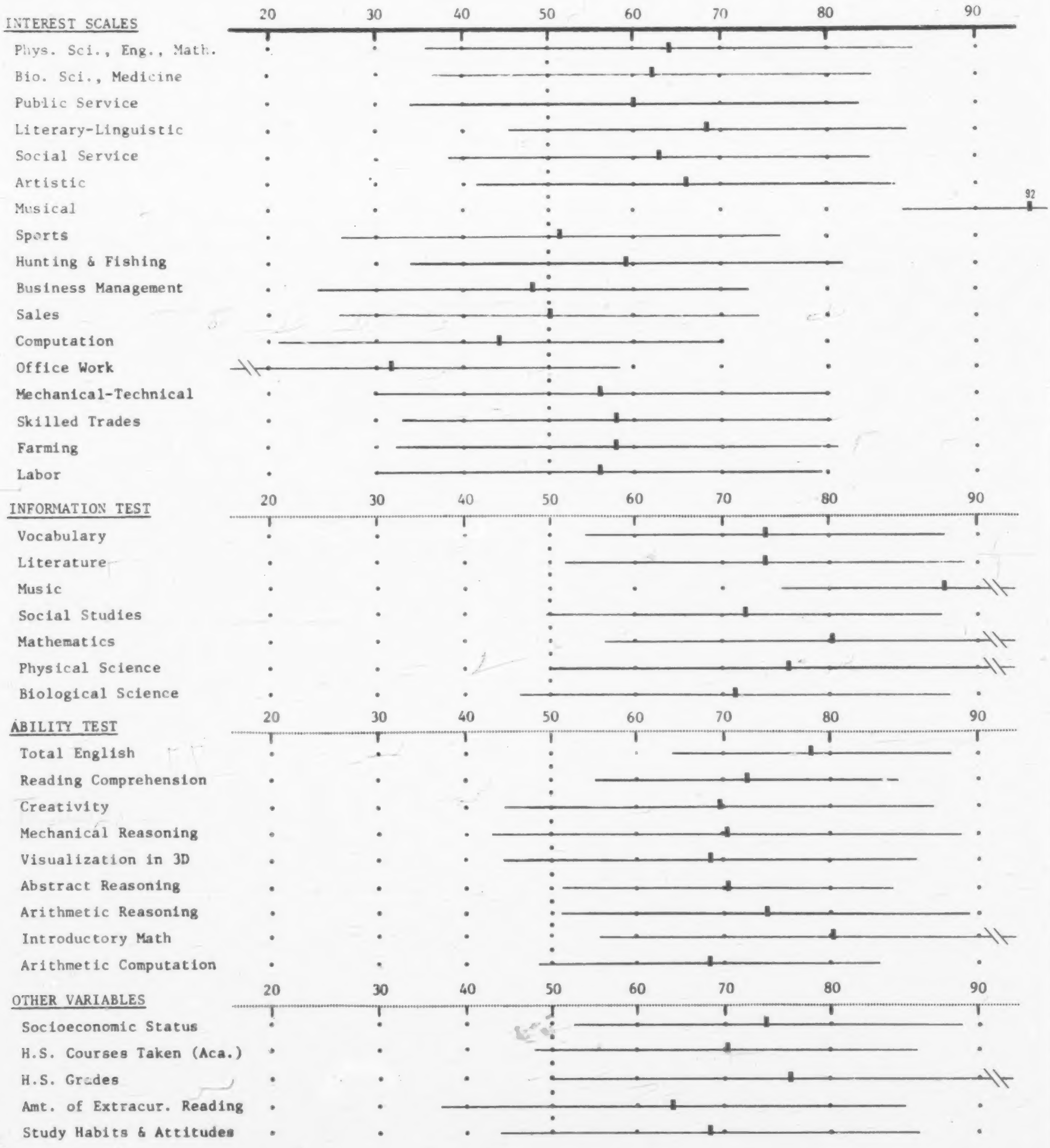
Others

General: High (76th percentile) in high school grades; low (64th percentile) in extracurricular reading.

Specific: 48th percentile in sociability; 55th percentile in social sensitivity, and self-perception of reading skills; 62nd percentile in self-confidence.

TEACHER - Music

(Female - n = 223)



THEATER WORKER

Importance: Theater part of national culture. In form of radio and TV reaches nearly every home. Much of education carried out informally by radio and TV, most important source of information to public.

Training: No formal education required for actors and actresses, but have usually attended drama school or have taken courses in drama. Dancers need training in dance courses or dancing school. Announcers, talk show leaders, etc. keep up with current affairs; should have good educational background. Professional jobs in broadcasting, including announcing, usually require college degree.

Work Activities: Actors and actresses perform roles in plays, in theater, movies, and television. Dancers do ancient, ethnic, and modern dances. Choreographers compose new dances. Producers, managers, and directors do managerial work. Announcers read news reports, conduct programs and interviews, present ads, and identify stations.

Outcomes: Entertainment and the transmission of information and culture.

Supervision; Social Relations: Actors, actresses, and dancers supervised by the play or dance director, indirectly by critics and public. TV and radio workers supervised directly by superiors in studio and indirectly by the public.

Salary; Other Benefits: These occupations strongly unionized. Stage actors and actresses get union pay scale as minimum. In 1970, $165/week for Broadway, $75 for off-Broadway, and $220 for road shows. Motion-picture actors and actresses, $120/day, extras $33/day. Actors on network television, $180 for half-hour program plus 10 hours rehearsal. For radio, $50 for half-hour program. In 1970, minimum salary for dancers in ballet, etc. about $155/week, $135 when rehearsing. Per diem for travel. Benefits for actors and dancers provided by union. Yearly salaries of actors, actresses, and dancers low because of infrequent employment. Salaries in broadcasting vary widely, usually being higher in large cities.

Role of Sexes: Both men and women in acting professions 90% of dancers women, but in ballet and modern dance half are men. Most announcers men, but a few women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (74th percentile) in literary-linguistic, artistic, and musical; lowest (38th percentile) in sports, and labor.

Information

General: Average around 71st percentile on information scores; high (77th percentile and above) in vocabulary, literature, and music; lowest (60th percentile) in biological science.

Specific: Quite high (85th percentile) in theater and ballet.

Abilities

General: Around the 69th percentile on ability scores; highest (78th percentile) in creativity; lowest (51st percentile) in arithmetic computation.

Specific: 69th percentile in memory for words.

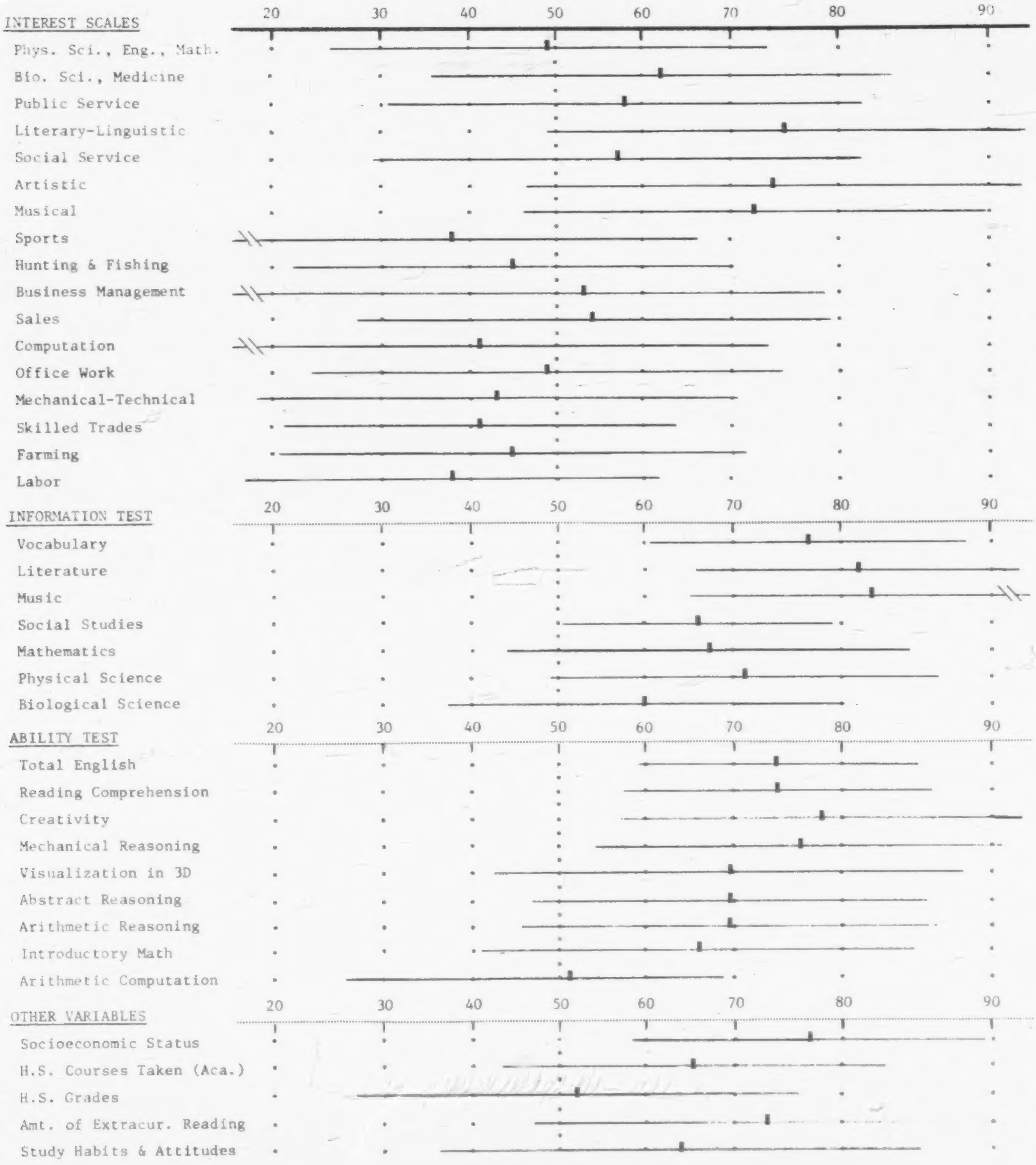
Others

General: High (77th percentile) in socioeconomic status; low (52nd percentile) in high school grades.

Specific: High (77th percentile) in self-confidence; 52nd percentile in sociability; 63rd percentile in social sensitivity, and self-perception of reading skills.

THEATER WORKER

(Male - n = 73)



CHAPTER 9

CAREER GROUP 7

Technical Positions

Technicians are workers who support scientists (including physicians and dentists) or engineers in testing, designing, developing, producing, and maintaining machines and materials. Unlike scientists and engineers, technicians are not required to have a highly specialized knowledge of one branch of science or mathematics. However, they must understand the basic principles of science and of applied mathematics.

There are many different kinds of technical workers. Some of the positions we have included in this group of technical workers are:

- Computer
  - EAM Operator, Supervisor, etc. (A)
  - Programmer (B)
  - Repair Serviceman (C)
- Dental Hygienist (Females) (d)
- Draftsman (E)
- Electronics
  - Technician (F)
  - Worker (not elsewhere classified) (G)
- Laboratory Technician
  - Biological Science, Dental, Medical (Females) (h)
  - Physical Science, Engineering, etc. (I)
- Photographer (J)
- Physical Therapist (Physiotherapist) (Females) (k)
- Specialized Therapist (Miscellaneous) (Females) (m)
- Surveyor (N)
- Technologist, Medical, Dental (Females) (r)

Special training is required for most technical workers, either in vocational schools, in the military, or in on-the-job training programs.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (64th percentile) in natural sciences; lowest (44th percentile) in business management, sales, and office work.

Information

General: Average around 59th percentile on information scores; highest (64th percentile) in mathematics, and physical science; low (57th percentile) in social studies.

Abilities

General: Around the 58th percentile on ability scores; highest (63rd percentile) in creativity, and mechanical reasoning; lowest (48th percentile) in arithmetic computation.

Specific: 60th percentile in memory for words.

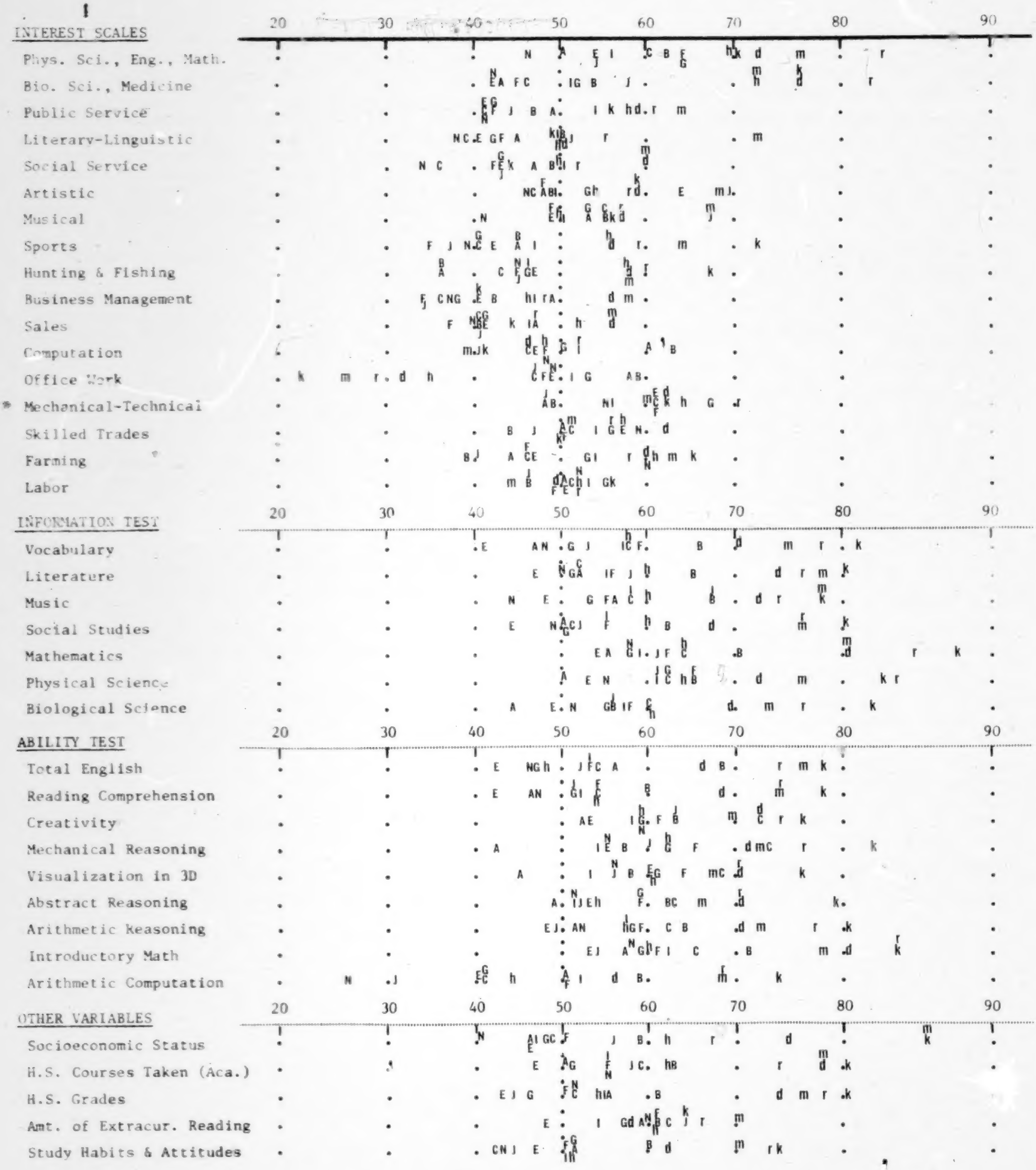
Others

General: High (61st percentile) in extracurricular reading; low (51st percentile) in study habits and attitudes.

Specific: 46th percentile in sociability; 56th percentile in self-perception of reading skills.

CAREER GROUP 7

Technical Positions



COMPUTER, EAM OPERATOR, SUPERVISOR

Importance: Government, finance, and science increasingly dependent on computers and electronic accounting machines. Most accounting, particularly for government and for large firms, now done by machine.

Training: Tabulating and bookkeeping machine operators may transfer to computer work. Other applicants usually required to have at least high school training or, if console operator, some college, but experience or aptitude may make up for this. Training usually on the job and requires several weeks; console operators also take classes.

EAM operators should be high school graduates. Many learn operation of electronic accounting machines on the job. Employer may have them take course in machine operation. Or may learn operation of accounting machines in vocational high school, business school, junior college. Good ability in arithmetic and capacity for attention to detail necessary.

Work Activities: As card-to-tape converter operator, computer operator wires plugboard and interprets signals from computer's panel lights. Recognizes when machine operating incorrectly. Console operator consults programmer's instructions, loads computer, manipulates it during the run, locates difficulties if operation faulty. Tape-to-card converter operators and high-speed printer operators translate output from machine language to words and numbers. Computer operators work chiefly for government, insurance companies, banks, public utilities, etc., or in companies selling computer service. Supervisor directs activities, checks accuracy.

EAM operator keeps financial records by use of machine. Lists debits and credits, bills to be paid and sent. Prepares payrolls, keeps inventories. May assist with other office work. Many work for government, industrial firms, etc. Supervisor found in offices employing several accountants. Supervisor may also do accounting.

Outcomes: For computer operator, correct answer to problems assigned or correct completion of procedure required of computer. For EAM operator, financial records accurately kept; arrangement made for appropriate expenditures.

Supervision; Social Relations: Small computers may require only one or two employees; large ones may require two or three shifts working under a chief supervisor. Some jobs combine supervisory duties and console operation. Computer and EAM operators supervised by superior in department or office.

Salary; Other Benefits: In 1970 average salary for beginning console operators $122 week; experienced averaged up to $200 week. Salaries vary widely. In federal government console operators began at about $113 a week; paid up to $190 week if experienced, or up to $273 a week if highly experienced supervisors. Evening and night work sometimes necessary. Surroundings airconditioned but noisy.

In 1970 beginning accounting clerks averaged $439 a month; experienced ones $568.

Role of Sexes: Both men and women work as computer operators and supervisors. Both men and women work as accountants and accountant supervisors, but most are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (59th percentile) in computation, and office work; lowest (36th percentile) in hunting and fishing.

Information

General: Average around 50th percentile on information scores; highest (56th percentile) in music and mathematics; lowest (44th percentile) in biological science.

Specific: 54th percentile in electricity and electronics, and accounting, business and sales.

Abilities

General: Around 50th percentile on ability scores; highest (57th percentile) in English, and introductory math; lowest (42nd percentile) in mechanical reasoning.

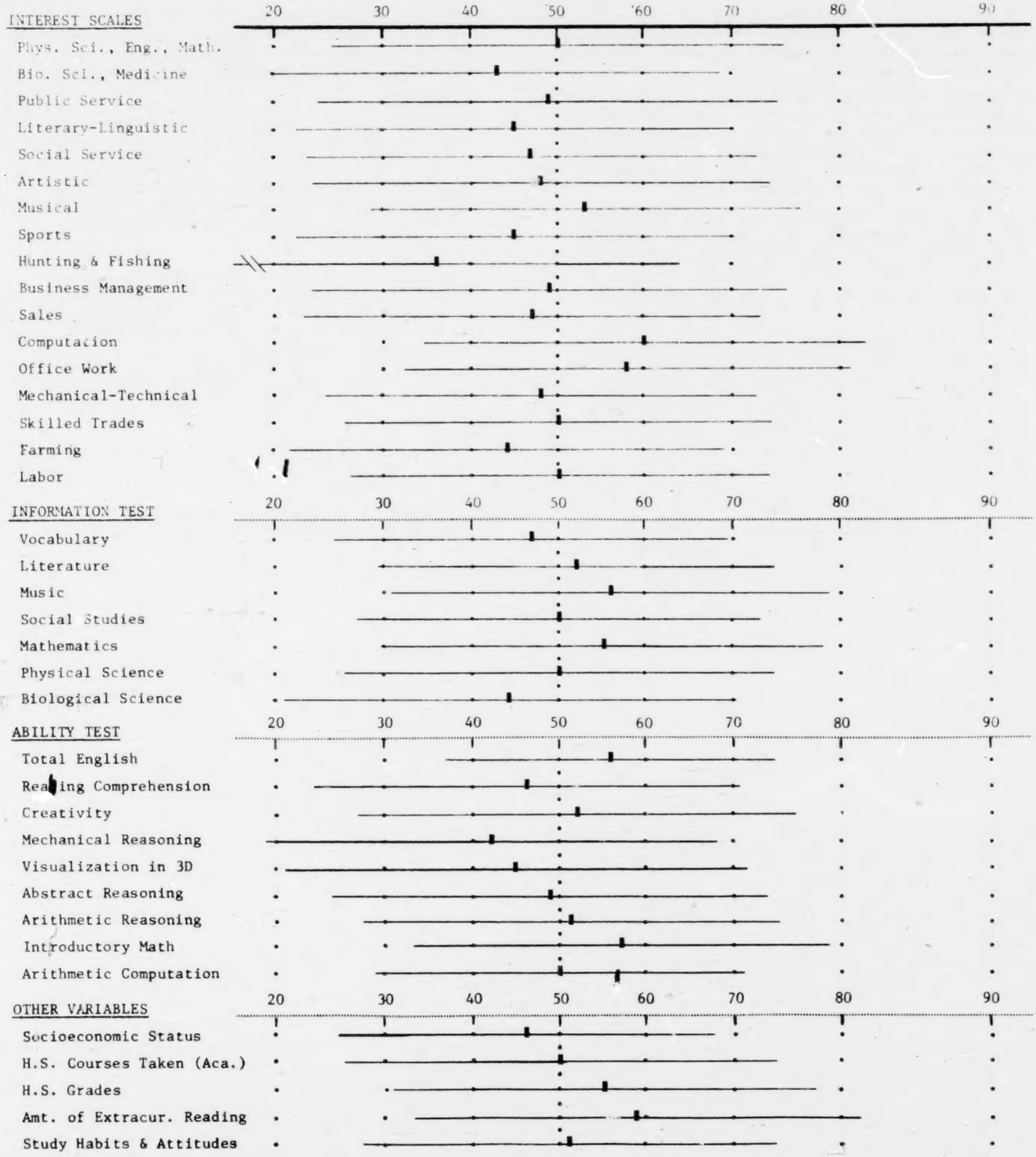
Others

General: High (59th percentile) in extracurricular reading; low (46th percentile) in socioeconomic status.

Specific: High (54th percentile) in sociability; 50th percentile in self-perception of reading skills.

COMPUTER, EAM OPERATOR, SUPERVISOR

(Male - n = 263)



COMPUTER PROGRAMMER

Importance: Our political and economic system increasingly dependent on computers. Much of manufacturing done under computer direction. Computers used for evaluation and planning.

Training: May learn computer programming by on-the-job experience or qualify by graduation from a computer programming course taken either in college or at a technical school. Some programmers begin as computer operators. Continuous updating of training needed as computer models and methods change.

Work Activities: Computer programmer learns one of the computer "languages" so that he can communicate with computer. Prepares step-by-step instructions telling just what to do to accomplish task.

Outcomes: Instructions for computer performance of given task.

Supervision; Social Relations: Computer programmer supervised by superiors in company, agency, etc.

Salary; Other Benefits: Salary moderately high. Other benefits dependent on company or agency worked for.

Role of Sexes: Both men and women employed as computer programmers. Good job for women because can often be done part-time.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (61st percentile) in physical science, engineering and mathematics, computation, and office work; lowest (40th percentile) in hunting and fishing, business management, sales, and farming.

Information

General: Average around 65th percentile on information scores; highest (70th percentile) in mathematics; lowest (56th percentile) in biological science.

Specific: 60th percentile in scientific attitude, engineering, and accounting, business and sales; 65th percentile in electricity and electronics.

Abilities

General: Around the 62nd percentile on ability scores; highest (70th percentile) in English, and introductory mathematics; lowest (58th percentile) in mechanical reasoning, three-dimensional visualization, and arithmetic computation.

Specific: High (72nd percentile) in advanced math; 66th percentile in memory for words.

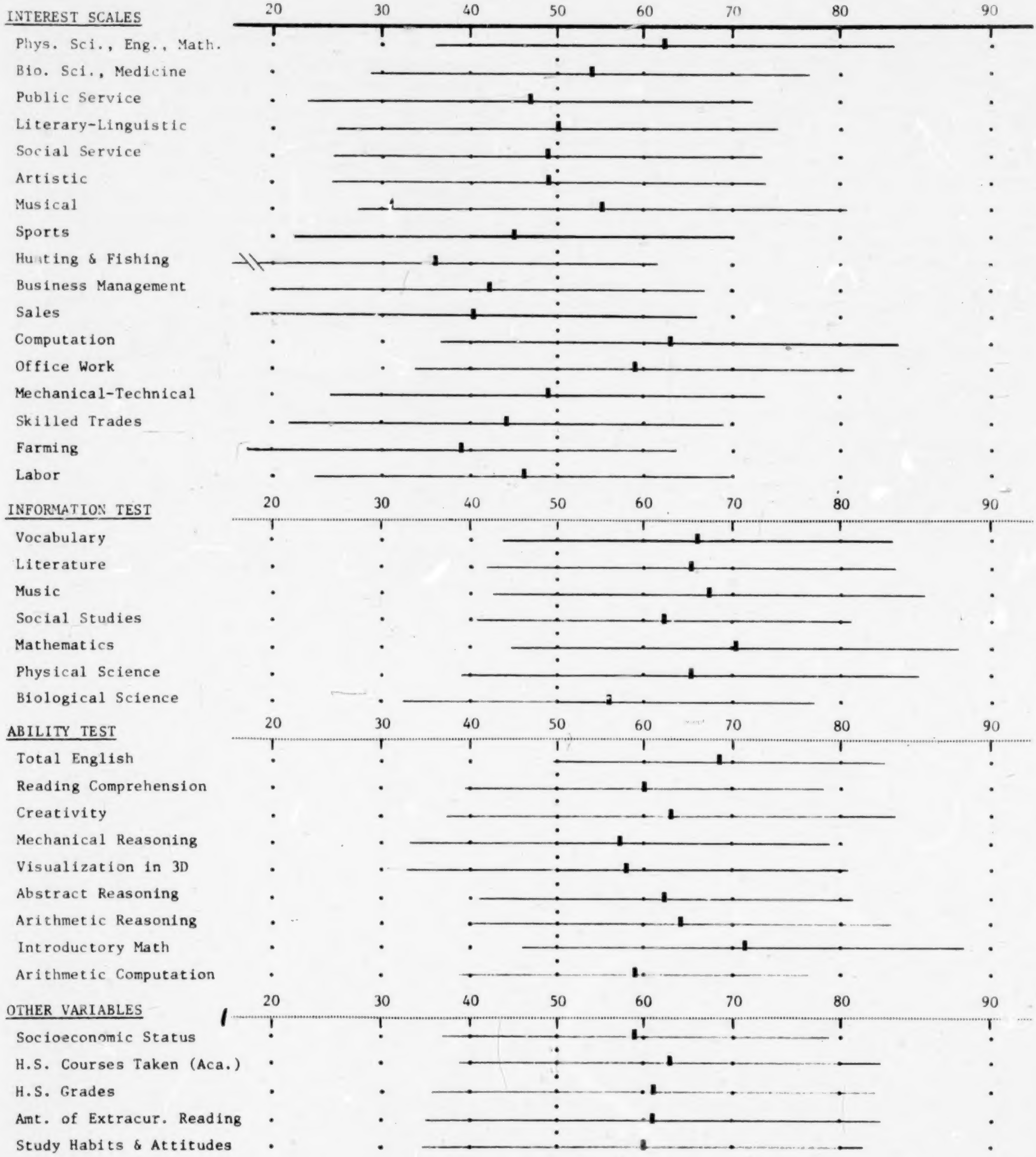
Others

General: High (63rd percentile) in academic orientation of courses; low (59th percentile) in socioeconomic status.

Specific: 49th percentile in sociability; 53rd percentile in self-perception of reading skills.

COMPUTER PROGRAMMER

(Male - n = 467)



COMPUTER REPAIR SERVICEMAN

Importance: Our economic and governmental system is heavily dependent on computers. Computers are delicate machines requiring maintenance, adjustment, and repair.

Training: Many computer repair servicemen have had previous experience as electronics technicians. Training in computer repair is usually on-the-job training, supplemented by courses or training schools provided by the computer companies.

Educational requirements range from high school to engineering degrees, depending on the kind of work the repairman is to do and the degree of sophistication of the machines on which he is to be working.

Work Activities: Diagnoses causes of malfunctioning, adjusts and replaces parts. Advises on care and use of computer.

Usually works on only one make of computer. May specialize in special type or model of computer within that make.

Outcomes: Properly functioning computers.

Supervision; Social Relationships: Supervised by superior at computer repair department.

Salary; Other Benefits: Salary varies widely according to employer, location, and difficulty of work done.

Role of Sexes: Mainly a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (61st percentile) in physical science, engineering and mathematics, and mechanical-technical; lowest (36th percentile) in social service, and business management.

Information

General: Average around 58th percentile in information scores; highest (64th percentile) in mathematics; lowest (51st percentile) in literature and social studies.

Specific: High (74th percentile) in electricity and electronics; 65th percentile in engineering.

Abilities

General: Around the 63rd percentile on ability scores; highest (73rd percentile) in creativity, and mechanical reasoning; lowest (41st percentile) in arithmetic computation.

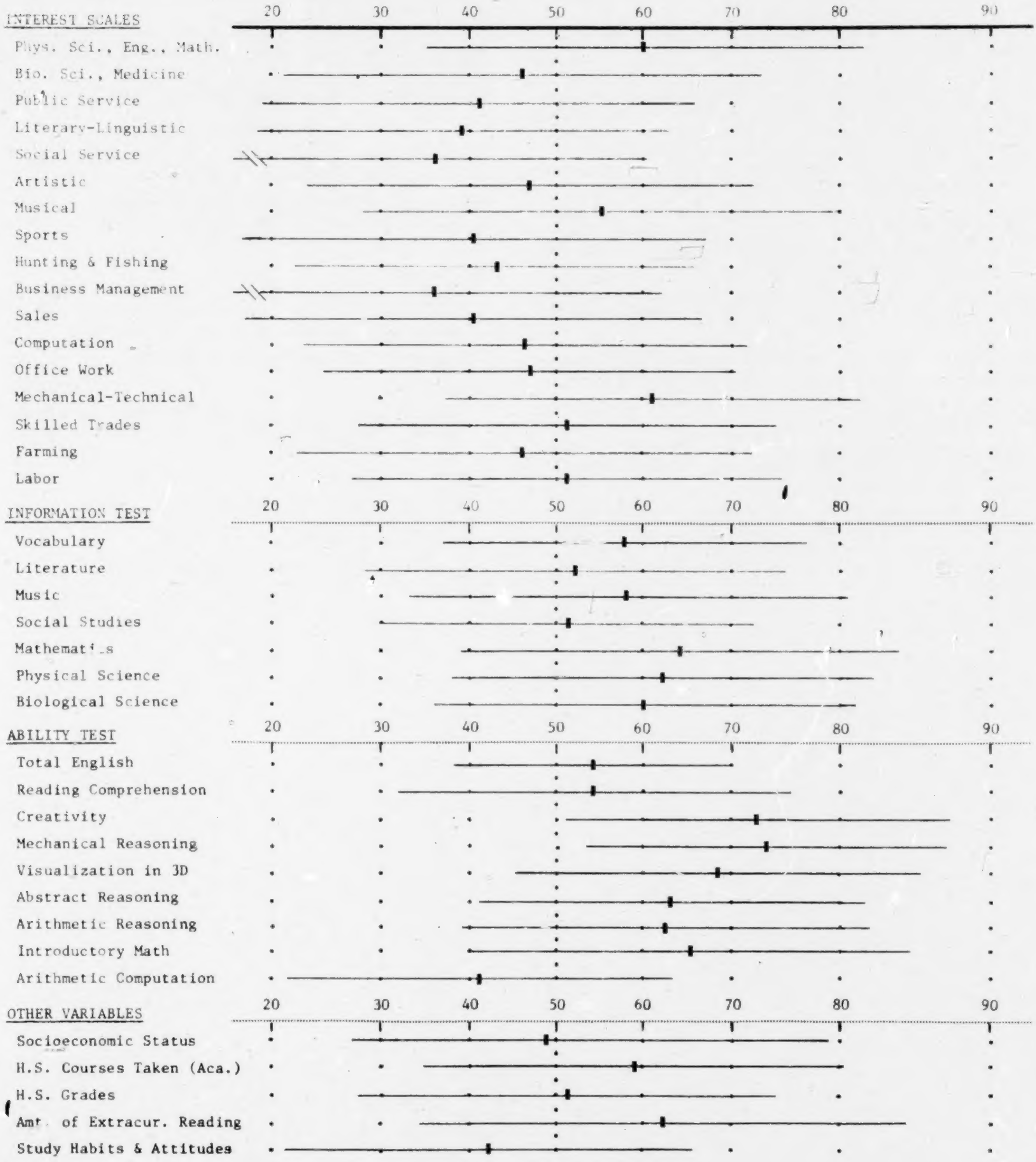
Others

General: High (62nd percentile) in extracurricular reading; low (42nd percentile) in study habits and attitudes.

Specific: High (52nd percentile) in self-perception of reading skills; 41st percentile in sociability.

COMPUTER REPAIR SERVICEMAN

(Male - n = 114)



DENTAL HYGIENIST

Importance: Saves time of dentist by doing routine tasks, thereby enabling him to treat more patients.

Training: Must have state license. In all but one state this requires graduation from dental hygiene school. 2-year course sufficient for assisting private dentist; 4-year course usually required for teaching, public health programs, etc. Must be high-school graduate to enter dental hygiene school. School gives both classroom training and clinical experience.

Work Activities: Cleans teeth, applies fluoride treatments, etc., instructs patient, records dental histories, takes and develops X-rays. May mix fillings and hand dentist instruments while he works.

Some work in school systems examining children's teeth, reporting needs to parents, teaching children mouth care.

Most dental hygienists work in private offices, some for schools, factories, clinics, armed forces, etc.

Outcomes: Teeth cleaned, X-rayed, patient instructed, records kept, dentist assisted.

Supervision; Social Relations: Supervised by the dentist or dentists for whom she works. Should have a manner reassuring to patients.

Salary; Other Benefits: Usually paid by salary but sometimes by commission. In 1970, graduates of 2-year dental hygiene course averaged about $6,000-$7,000; graduates of four-year course a thousand dollars more. Dental hygienists starting work for federal government began at $5,853 or $6,548. Sometimes work evenings and Saturdays.

Role of Sexes: Most dental hygienists are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (75th percentile) in natural sciences; low (46th percentile) in computation; lowest (32nd percentile) in office work.

Information

General: Average around 72nd percentile on information scores; highest (80th percentile) in mathematics; lowest (67th percentile) in social studies.

Specific: 68th percentile in health.

Abilities

General: Around 70th percentile on ability scores; highest (80th percentile) in introductory math; lowest (56th percentile) in arithmetic computation.

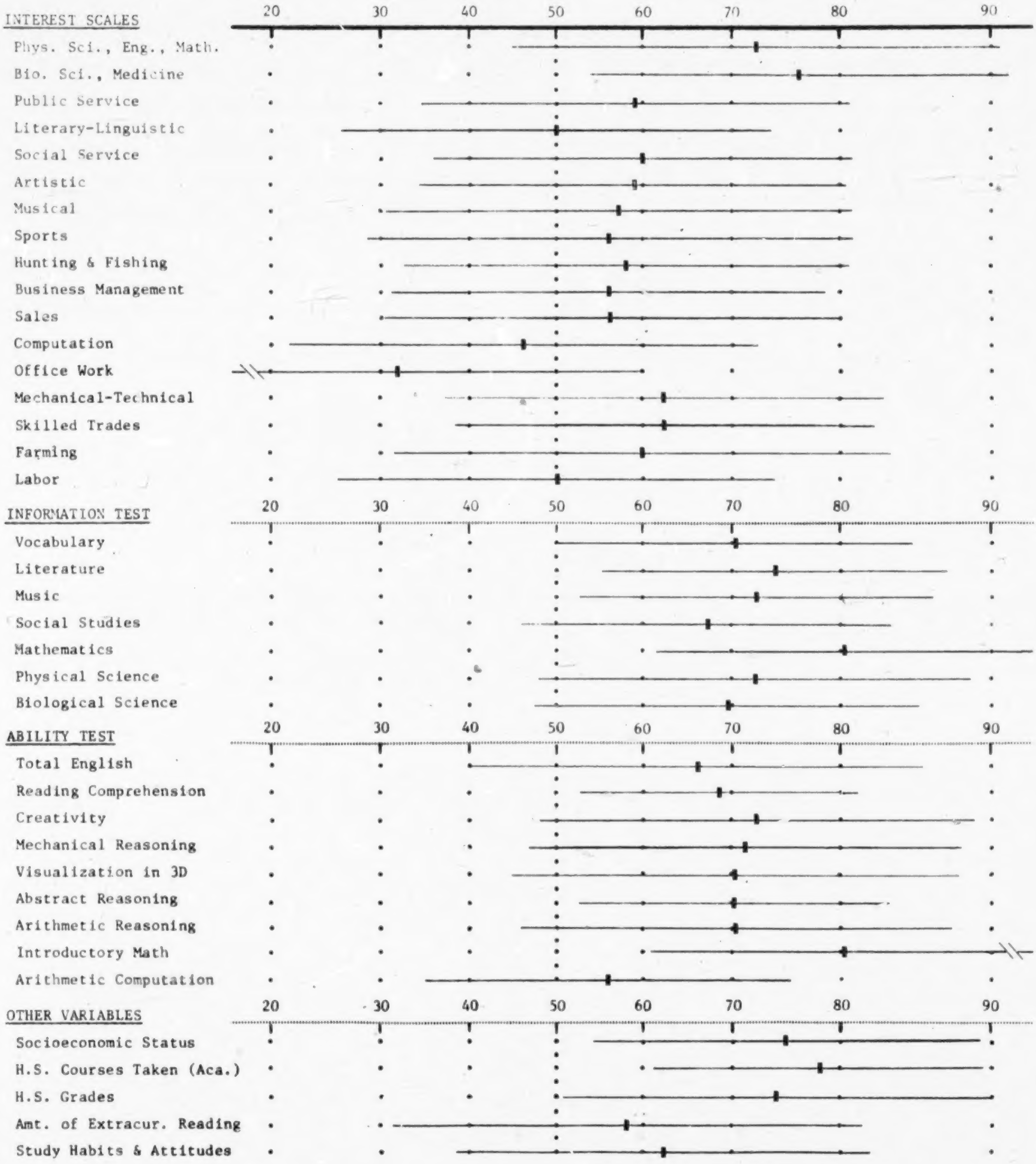
Others

General: High (78th percentile) in academic orientation of courses; low (58th percentile) in extracurricular reading.

Specific: 54th percentile in sociability.

DENTAL HYGIENIST

(Female - n = 100)



DRAFTSMAN

Importance: Ideas of engineers, architects, and designers must be translated into specific directions showing size, structure, and materials before they can be turned into reality.

Training: May qualify by taking courses in draftsmanship in high schools, technical schools, junior colleges, etc. Should also take courses in the physical sciences and mathematics, and if possible learn shop skills and something about manufacturing methods. Some employers, including federal government, provide on-the-job training.

Work Activities: Often begin as tracers, who make corrections on drawings and get them ready to be reproduced. Checker examines drawings and specifications for errors. Detailer makes drawings and writes specifications for each separate part of the thing to be made. Senior draftsman prepares scale drawings of object to be constructed. Draftsmen often begin as tracers if their training has not been complete. Draftsmen use drawing instruments, engineering handbooks, slide rules, and mechanical drawing equipment. Nine-tenths of draftsmen work for private industry.

Outcomes: Plans, drawings, and written specifications concerning materials, etc., for each object and part of an object to be manufactured or constructed. Must be complete and highly accurate.

Supervision; Social Relations: Supervised by other draftsman of higher rank or those in charge of the job, and by persons whose ideas they are interpreting.

Salary; Other Benefits: In 1970 draftsmen in private industry began at about $470 a month, and trainee draftsmen in federal Civil Service at about $380. Experienced draftsmen in private industry earned about $700 a month, those working for government $600 to $740. Senior draftsmen in private industry averaged $850.

Role of Sexes: Almost 4% of 1970 draftsmen were women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (62nd percentile) in artistic, and mechanical-technical; lowest (40th percentile) in literary-linguistic, and business management.

Information

General: Average around 48th percentile on information scores; highest (54th percentile) in mathematics, and physical science; lowest (41st percentile) in vocabulary.

Specific: 49th percentile in engineering, and architecture.

Abilities

General: Around 53rd percentile on ability scores; highest (60th percentile) in three-dimensional visualization; lowest (41st percentile) in English, reading comprehension, and arithmetic computation.

Specific: High (67th percentile) in table reading; 53rd percentile in two-dimensional visualization, and advanced math.

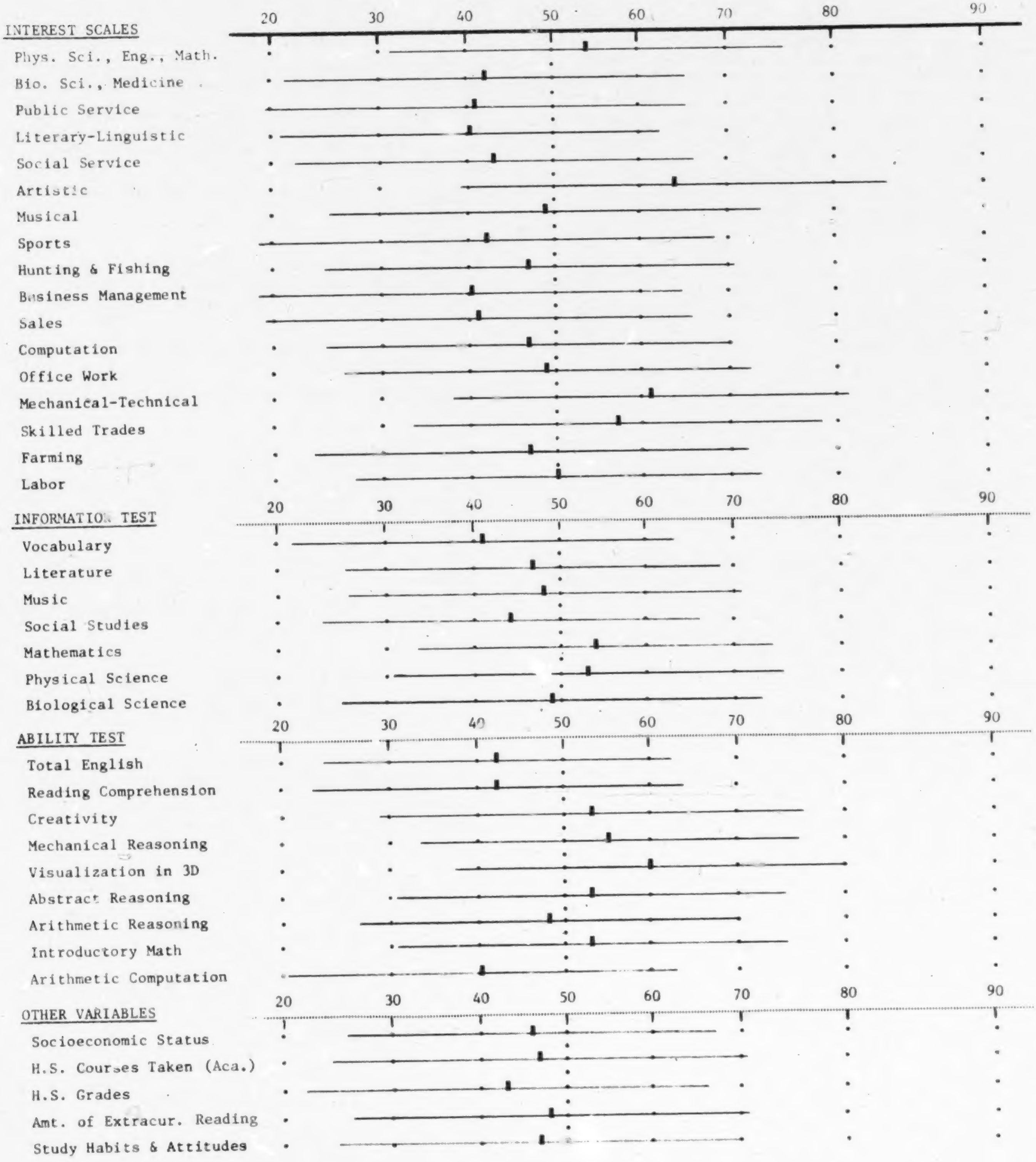
Others

General: High (48th percentile) in extracurricular reading; low (43rd percentile) in high school grades.

Specific: 42nd percentile in sociability, and self-perception of reading skills.

DRAFTSMAN

(Male - n = 406)



ELECTRONICS TECHNICIAN

Importance: Many technicians needed in increasingly electronic manufacturing and information systems. Assistance of technicians enables scientists to achieve more than they otherwise could.

Training: Usually need formal training gotten in college or technical school, correspondence school, etc., but may learn by on-the-job training or in the armed forces. Formal training may take 1 to 4 years after high school. Training in electronics also available by formal apprenticeship. Many technicians trained by armed forces; some as federal civilian employees.

Work Activities: Carries out some of work directed by scientist. Works on radio, television, telephones, radar, spacecraft guidance systems, electronic computers, etc. Usually specializes in some particular area of electronics.

Does work more difficult than ordinary operating and repair work, but requiring less knowledge and skill than that of scientist or engineer. May supervise other workers. Often uses complex instruments and apparatus, consults handbooks, uses slide rules, etc.

Outcomes: Accomplishment of duties in fields using electronics.

Supervision; Social Relations: Supervision by immediate superior.

Salary; Other Benefits: Dependent on place of employment. In 1970 beginning engineering and science technicians entering government service were offered $5,212, $5,853, or $6,548. Starting salaries in private industry for technicians with associate degrees averaged about $7,400. Technicians with responsible jobs in private industry averaged nearly $11,000 in 1970.

Role of Sexes: In 1970 about 11% of engineering and science technicians (not including draftsmen and surveyors) were women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (62nd percentile) in physical science, engineering and mathematics, and mechanical-technical; lowest (35th percentile) in sports, business management, and sales.

Similar to: Electronic Worker (not elsewhere classified)

Information

General: Average around 58th percentile on information scores; highest (65th percentile) in physical science; lowest (55th percentile) in music, and social studies.

Specific: Quite high (76th percentile) in electricity and electronics.

Similar to: Electronic Worker (not elsewhere classified)

Abilities

General: Around the 59th percentile on ability scores; highest (65th percentile) in mechanical reasoning, and three-dimensional visualization; lowest (52nd percentile) in English, reading comprehension, and arithmetic computation.

Specific: 61st percentile in table reading, and advanced math; 57th percentile in memory for words.

Similar to: Electronic Worker (not elsewhere classified) at slightly higher level.

Others

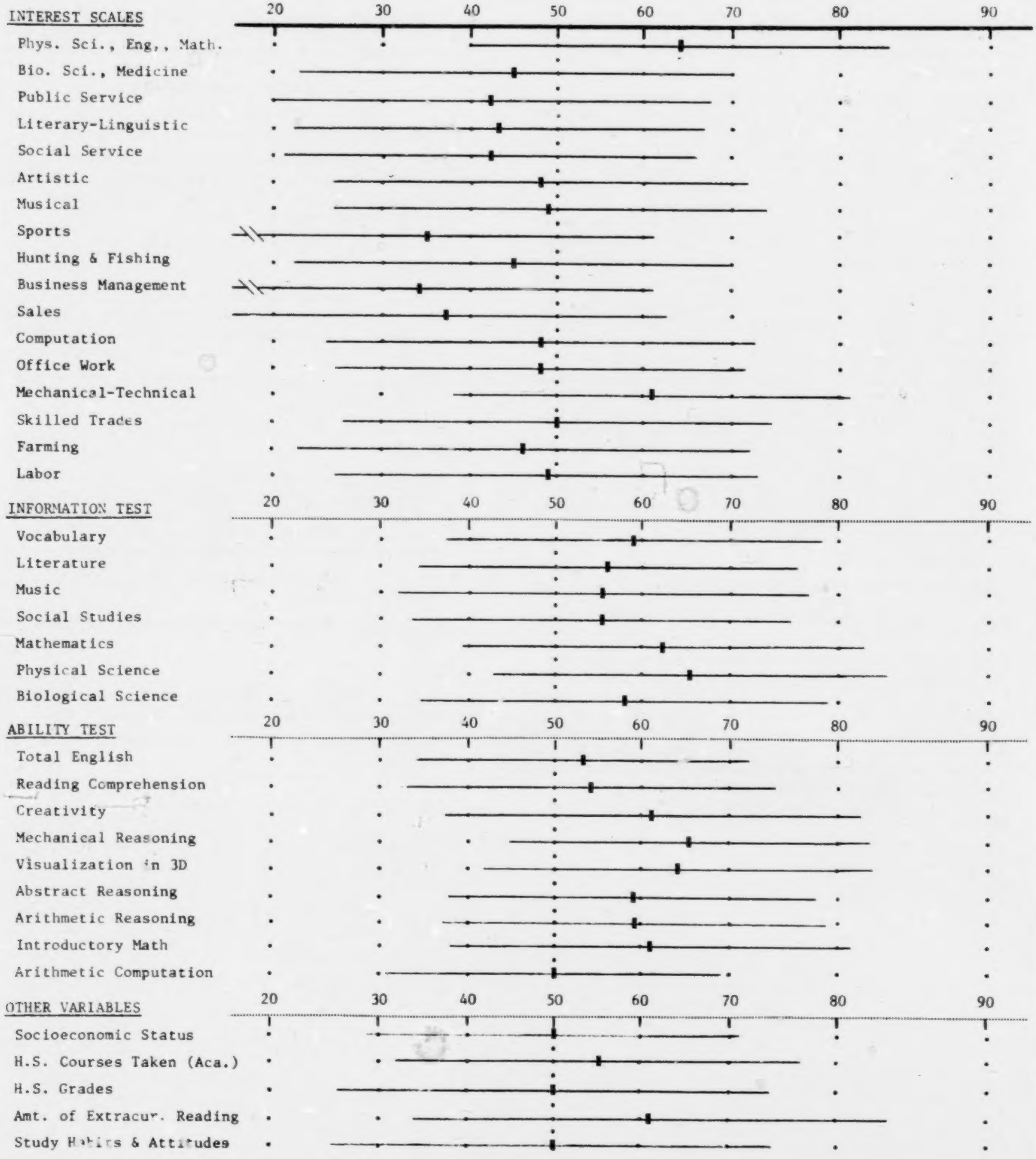
General: High (61st percentile) in extracurricular reading; low (50th percentile) in socioeconomic status, high school grades, and study habits and attitudes.

Specific: High (51st percentile) in self-perception of reading skills; 42nd percentile in sociability.

Similar to: Electronic Worker (not elsewhere classified)

ELECTRONICS TECHNICIAN

(Male - n = 720)



ELECTRONICS WORKER (not elsewhere classified)

Importance: Electronic instruments necessary for modern communications, computer work, warfare, automated manufacturing. Also widely used in inspection and checking.

Training: Depends on type of job. For most electronics workers, on-the-job training usually adequate, though aptitude tests and high-school diplomas often required. For technicians, see p. 194. For some beginning administrative workers, college degree in business administration, accounting, or engineering required. For electronic engineers, see p. 38. For draftsmen, see p. 192. Technical writers often have degrees in English or journalism, have taken science and engineering courses or on-the-job electronics courses.

Work Activities: Do manufacturing, checking, and operating work on radio, radar, television, telephone apparatus, industrial controlling devices, navigation instruments, electronic computers, and other devices dependent on flow of electrons for their effectiveness. Electronic workers do jobs that do not require technician's level of training. Majority of electronics plant workers are assemblers, mainly semi-skilled. Much hand assembly. Use diagrams, taped and recorded instructions. Some machine assembly. Also work as machinists, fabricating workers (as glass lathe operators), processing workers, parts changers, electroplaters, testers. Technical writers compose manuals, explanatory material. For work of electronics technicians, see p. 194.

Outcomes: Successfully operating electronic devices.

Supervision; Social Relations: Usually supervised by immediate superior.

Salary; Other Benefits: Vary according to type of work, employer, etc. For electronics technician, see p. 194. In 1970 electronics production workers making government and industrial electronics end products averaged $150 per week, those making radios, television sets, and phonographs $127, those making electron tubes $114, and those making semiconductors and other components $108. Working conditions better than in most factories. Often have vacations with pay, pensions, etc.

Role of Sexes: More than forty percent of employees of electronics manufacturing plants are women. Assemblers mainly women. Most women in semiskilled jobs.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (66th percentile) in physical science, engineering and mathematics, and mechanical-technical; low (40th percentile) in sports, business management, and sales.

Similar to: Electronic Technician

Information

General: Average around 53rd percentile on information scores; highest (60th percentile) in mathematics, and physical science; lowest (51st percentile) in vocabulary, literature, and social studies.

Specific: Very high (72nd percentile) in electricity and electronics.

Similar to: Electronic Technician

Abilities

General: Around the 59th percentile on ability scores; highest (62nd percentile) in mechanical reasoning, and three-dimensional visualization; lowest (51st percentile and below) in English, reading comprehension, and arithmetic computation.

Specific: 56th percentile in table reading, and memory for words.

Similar to: Electronic Technician at slightly lower level.

Others

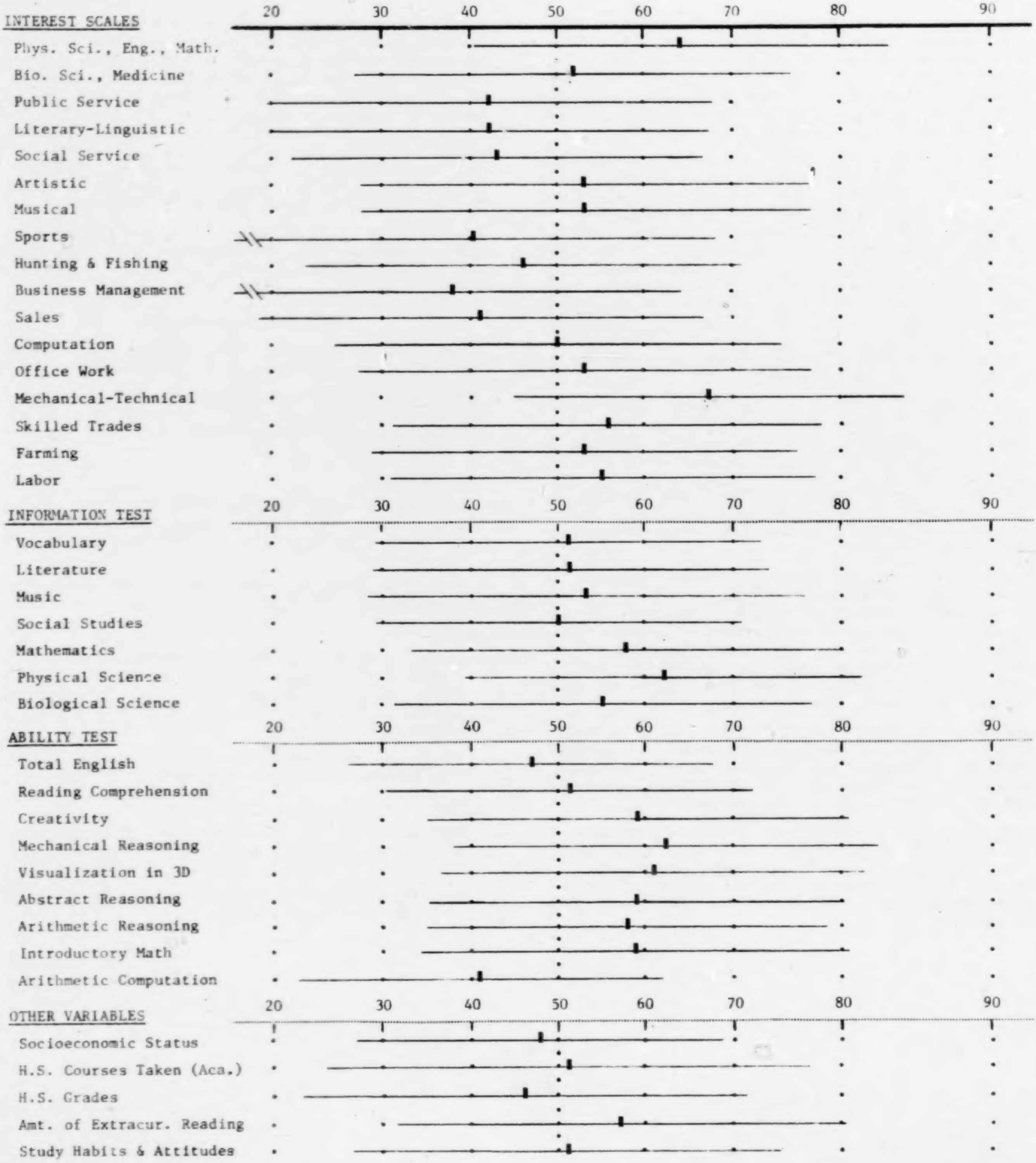
General: High (57th percentile) in extracurricular reading; low (46th percentile) in high school grades.

Specific: 42nd percentile in sociability, and self-perception of writing skills; 51st percentile in self-perception of reading skills.

Similar to: Electronic Technician

ELECTRONICS WORKER (not elsewhere classified)

(Male - n = 325)



LABORATORY TECHNICIAN - Biological Science, Dental, Medical

Importance: Medical technician, technician in biological sciences, helps provide physician or scientist with accurate information and practical services. Dental technician, by doing work formerly done by dentist, enables dentist to have more time for working on patients. Accurate work increases dental efficiency and contributes to well-being of patient.

Training: Medical or biological science technician may take 1 to 4 years of training in junior college, 4-year college, or university. May take courses at technical schools or while in armed forces. For dental technician, no minimum formal education required; skills usually learned on the job. On-the-job training takes 3-4 years; may be done along with formal courses. In some junior colleges, etc., 1 or 2 year programs in dental laboratory technology available. About 3 years' practical experience needed to become fully qualified dental technician. Certification by National Association of Certified Dental Laboratories available and may become important qualification.

Work Activities: Technician functions at level higher than laboratory assistant but lower than technologist. Medical or laboratory technician examines fluids, cultures, and tissues by tests and examinations. May specialize in one particular field or type of test. May assist with and record results of experiments. Uses laboratory equipment and machines. Works mainly in hospitals and clinics, but also in laboratories, research organizations, etc.

Dental technician makes dentures, crowns, bridges, casts, inlays, orthodontic appliances, etc. according to dentist's instructions for use by dentist. May specialize in one particular product or process. Uses lathes, drills, furnaces, and other laboratory equipment. Works mainly in commercial laboratories but some employed by individual dentists, hospitals, armed forces, and Veterans Administration.

Outcomes: For medical or biological laboratory technician, provision of accurate information to physician, superior or person requesting information. For dental technician, correctly made dental parts and appliances for use by dentist in treating patient.

Supervision; Social Relations: Medical technician may be supervised by medical technologist or by physician; biological sciences laboratory technician by scientist or technologist. Dental technician supervised by superior or by head of laboratory; indirectly by dentist.

Salary; Other Benefits: In 1970 medical laboratory assistants and technicians going to work for federal government started at $4,621 to $5,853 a year. 40-hour week general; some night and weekend duty. In 1970, dental technician trainees paid about $78 week; technicians in commercial laboratories with 10 or more years' experience $170-$225 week. Foremen and managers up to $300 week. Self-employed usually earn more but work longer hours. In federal government, inexperienced dental laboratory technicians started at about $112 a week; experienced ones paid $166-$195 a week.

Role of Sexes: 80% to 90% of all medical laboratory workers women in 1970, but proportion of men increasing. About one-fifth of dental laboratory technicians women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (71st percentile) in physical science, engineering and mathematics, and biological science and medicine; lowest (35th percentile) in office work.

Information

General: Average around 60th percentile on information scores; highest (64th percentile) in mathematics, and physical science; low (58th percentile) in vocabulary.

Specific: 55th percentile in scientific attitude, and health.

Abilities

General: Around the 57th percentile on ability scores; highest (61st percentile) in mechanical reasoning, three-dimensional visualization, and introductory math; lowest (44th percentile) in arithmetic computation.

Specific: High (72nd percentile) in table reading; 52nd percentile in memory for words.

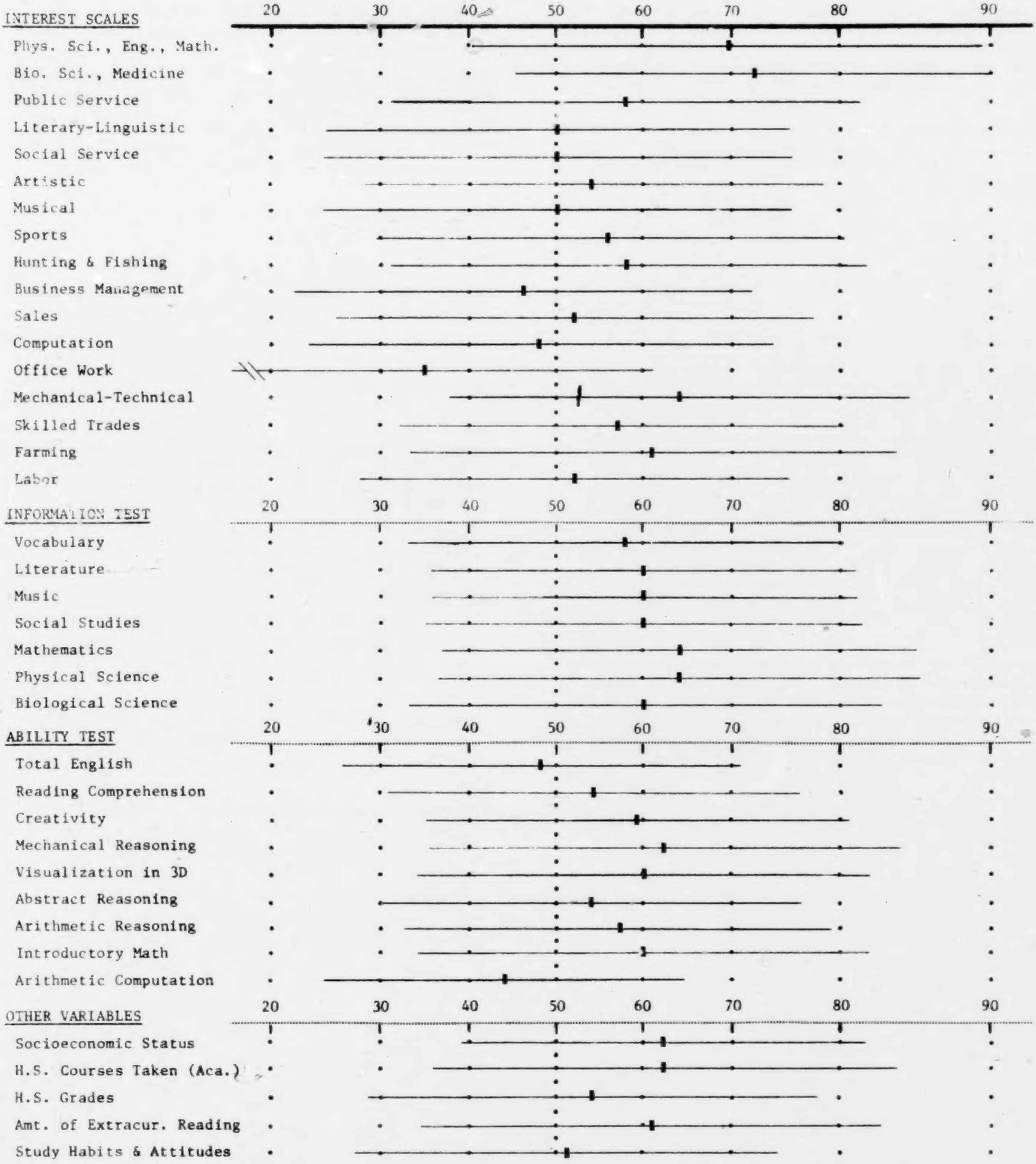
Others

General: High (62nd percentile) in socioeconomic status, and academic orientation of courses; low (51st percentile) in study habits and attitudes.

Specific: 49th percentile in sociability, and self-perception of reading skills.

LABORATORY TECHNICIAN - Biological Science, Dental, Medical

(Female - n = 441)



LABORATORY TECHNICIAN - Physical Science, Engineering, etc.

Importance: Several technicians needed for each scientist. Technicians form a bridge between the scientist and the routine worker, perform many tasks that would otherwise have to be done by scientists. Role of technician a vital one in a technological society.

Training: Need solid grounding in science and mathematics; good high school education desirable. Training may be acquired in technical institutes, junior or community colleges, extension courses, technical and vocational high schools. Some learn on the job and through correspondence courses; some in armed forces training schools. Some technicians trained by federal government.

Increasing number of technical jobs now require post-secondary-school training. Programs for training of technicians may take 1 to 4 years; usual period of post-high-school training two years.

Work Activities: Term technician includes a wide range of activities and ability. Technicians' jobs more limited and practical than those of engineer or scientist, but often analyze and solve problems, perform tests, write formal reports. Some technicians' jobs supervisory. Most need to be able to use engineering handbooks, complex instruments, computing devices. May design equipment, set up experiments. May aid in production operations, serve as sales, installation, and field representatives, write technical manuals. Work in aeronautical technology, air-conditioning, heating and refrigeration, chemical technology, civil engineering and surveying, electronocs, industrial production, mechanical technology, instrumentation technology, atomic energy, radiation, safety, ecology.

Over 7/10 of technicians employed by private industry, especially manufacturing, communications, engineering, architecture. Many work for federal government, mainly Defense Department but also for Departments of Transportation, Agriculture, Interior, and Commerce; others for state and local government, colleges, research organizations.

Outcomes: Performance of technological tasks which would otherwise require the attention of a scientist or engineer.

Supervision; Social Relations: Supervised by superior in organization; if high-ranking technician, often by scientist or engineer.

Salary; Other Benefits: In 1970, beginning engineering and science technicians going to work for federal government started at $5,212 to $6,548. In private industry technicians with associate degrees had starting salaries averaging about $7,400. Annual salary of persons in responsible technical positions nearly $11,000.

Role of Sexes: In 1970 about 11% of engineering and science technicians were women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (56th percentile) in physical science, engineering and mathematics, and mechanical-technical; lowest (46th percentile) in hunting and fishing, and sales.

Information

General: Average around 57th percentile on information scores; highest (61st percentile) in physical science; lowest (55th percentile) in literature, and social studies.

Specific: High (65th percentile) in electricity and electronics; 53rd percentile in engineering; 50th percentile in scientific attitude.

Abilities

General: Around the 53rd percentile on ability scores; highest (62nd percentile) in introductory mathematics; lowest (52nd percentile) in reading comprehension, abstract reasoning, and arithmetic computation.

Specific: High (66th percentile) in table reading; 59th percentile in memory for words, and advanced math.

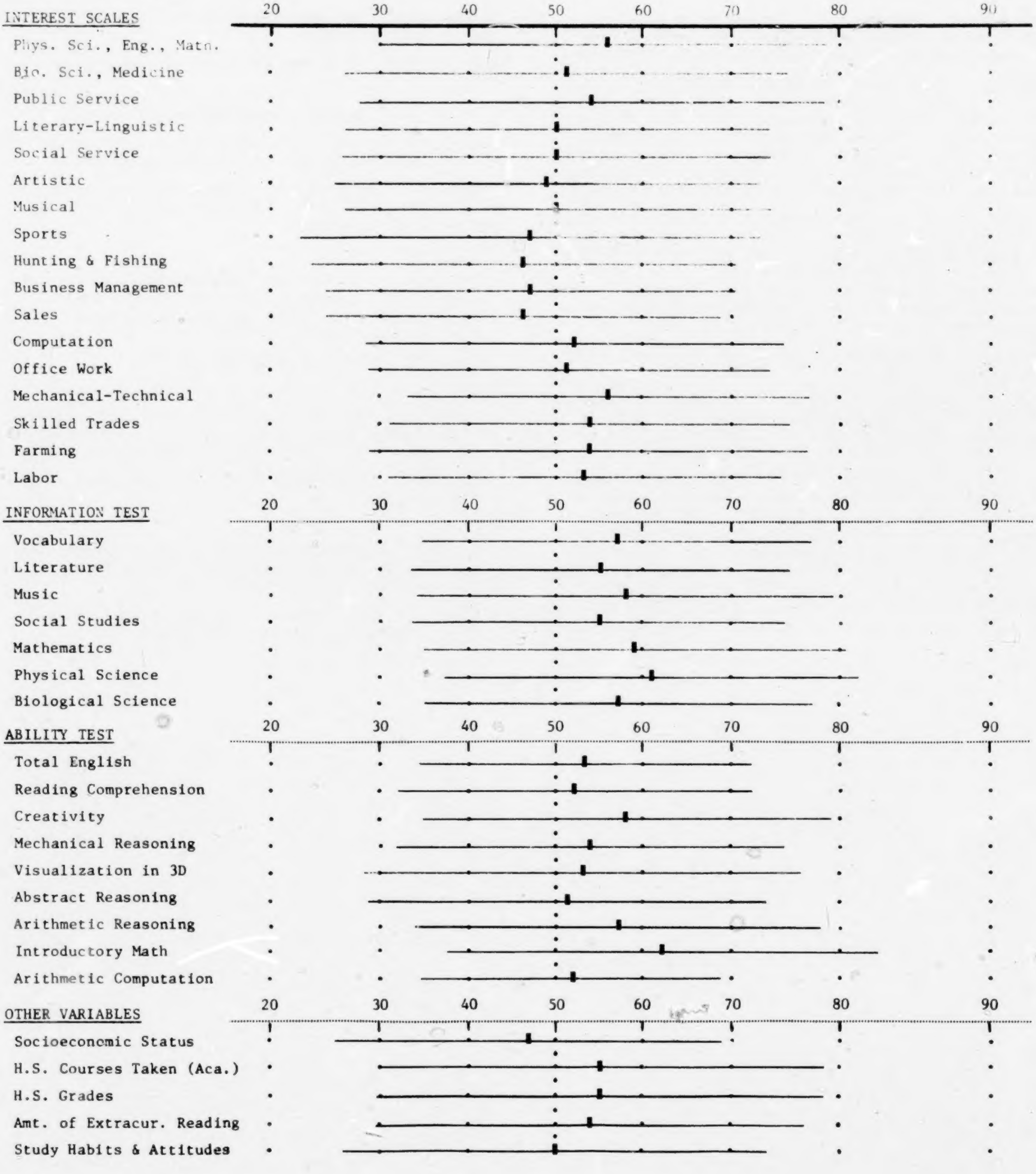
Others

General: High (55th percentile) in academic orientation of courses, and high school grades; low (47th percentile) in socioeconomic status.

Specific: 50th percentile in sociability, and self-perception of reading and writing skills.

LABORATORY TECHNICIAN - Physical Science, Engineering, etc.

(Male - n = 262)



PHOTOGRAPHER

Importance: Provision of pictorial records. Some photographs artistic productions. Photographs used in industry, medicine, advertising, warfare, publishing.

Training: Many learn photography by on-the-job training or 3 years' apprenticeship. Others take courses in college, technical institutes, etc. Some colleges offer degrees with photography major. To do industrial, news, or scientific photography usually need good deal of post-high school training. For industrial and scientific photography must know subject matter.

Work Activities: Photographer chooses film and filters, takes pictures, develops, enlarges, and prints them. May work in studio, for industry, for government, for newspaper. Usually specializes in either still or moving photography. May specialize in portrait, industrial, scientific, news, aerial, educational, etc. photography.

Outcomes: Photographs that meet the requirements for which they were taken.

Supervision; Social Relations: Supervised by immediate superior or, if free-lance, by person commissioning pictures. Social ability to put subject at ease essential in portrait and some news photography.

Salary; Other Benefits: In 1970, photographers began at $125 to $140 a week. News photographers began at rates set by the union, from $95 to $200 or more a week, depending on the paper. Experienced (4-6 years) news photographers averaged about $200 a week. If in federal Civil Service entered at $5,853 and up, depending on experience. Most experienced photographers working for federal government earned $6,500 to $14,000 a year. Salaries of self-employed usually higher but undependable. For news and commercial photographers, travel often necessary.

Role of Sexes: Both men and women work as photographers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (68th percentile) in artistic, and musical; lowest (36th percentile) in sports, and business management.

Information

General: Average around 58th percentile on information scores; highest (67th percentile) in music; lowest (53rd percentile) in vocabulary, social studies, and biological science.

Specific: 63rd percentile in art.

Abilities

General: Around 52nd percentile on ability scores; highest (63rd percentile) in creativity; very low (31st percentile) in arithmetic computation.

Specific: 50th percentile in two-dimensional visualization.

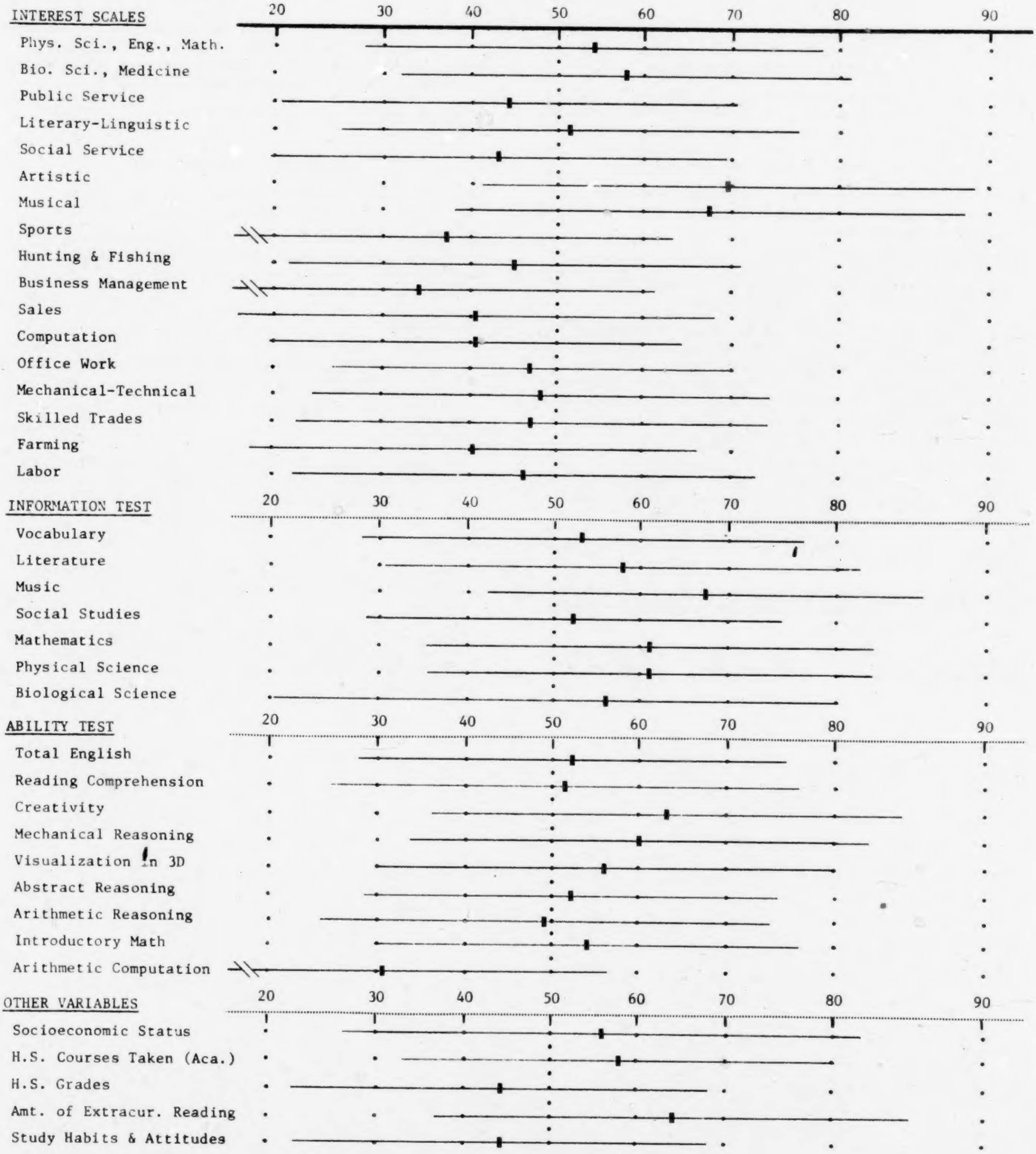
Others

General: High (64th percentile) in extracurricular reading; low (44th percentile) in high school grades, and study habits and attitudes.

Specific: High (59th percentile) in social sensitivity; 40th percentile in sociability.

PHOTOGRAPHER

(Male - n = 122)



PHYSICAL THERAPIST (Physiotherapist)

Importance: Helps implement the work of physician by applying special knowledge of muscle, nerve, joint, and bone treatment to aid disabled individuals.

Training: Licensing required in all but one state. Must be graduate of school of physical therapy and pass state examination. Physical therapy schools require varying amounts of college work as prerequisites. Some offer choice of degree or certificate programs.

Physical therapy student studies anatomy, psychology, electrotherapy, massage, etc., and also does practical work under supervision.

May also take master's degree in physical therapy.

Training in physical therapy at accredited school available to members of armed forces.

Work Activities: Helps physician plan and carries out programs of exercise and treatment for accident victims and crippled and disabled persons. Gives exercises, massage, electrical therapy, heat and cold treatments. Teaches patient and his family rules for care and exercise. May specialize in certain types of illness, as care of paralytic patients or spastic children.

About three-quarters of physical therapists work in hospitals and nursing homes. Some for rehabilitation centers, some self-employed, some for private doctors or clinics, some for armed forces.

Outcomes: Improved condition of patient, education of patient and family in regard to his needs.

Supervision; Social Relationships: Usually works as part of health care team headed by physician. Capacity for teamwork necessary.

Salary; Other Benefits: In 1970 beginning physical therapists started at $8,000-$10,000. Experienced earned $14,000-$20,000. In educational or administrative jobs, $15,000-$25,000. Beginning therapists going to work for federal government started at $7,294 or $8,098. Usually good fringe benefits.

Role of Sexes: Two-thirds of physical therapists women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (73rd percentile) in physical science, engineering and mathematics, biological science and medicine, and sports; lowest (22nd percentile) in office work.

Information

General: Around the 81st percentile on information scores; highest (88th percentile) in mathematics; lowest (78th percentile) in music.

Specific: 74th percentile in health.

Abilities

General: Around the 78th percentile on ability scores; highest (83rd percentile) in mechanical reasoning, and introductory mathematics; lowest (74th percentile) in arithmetic computation.

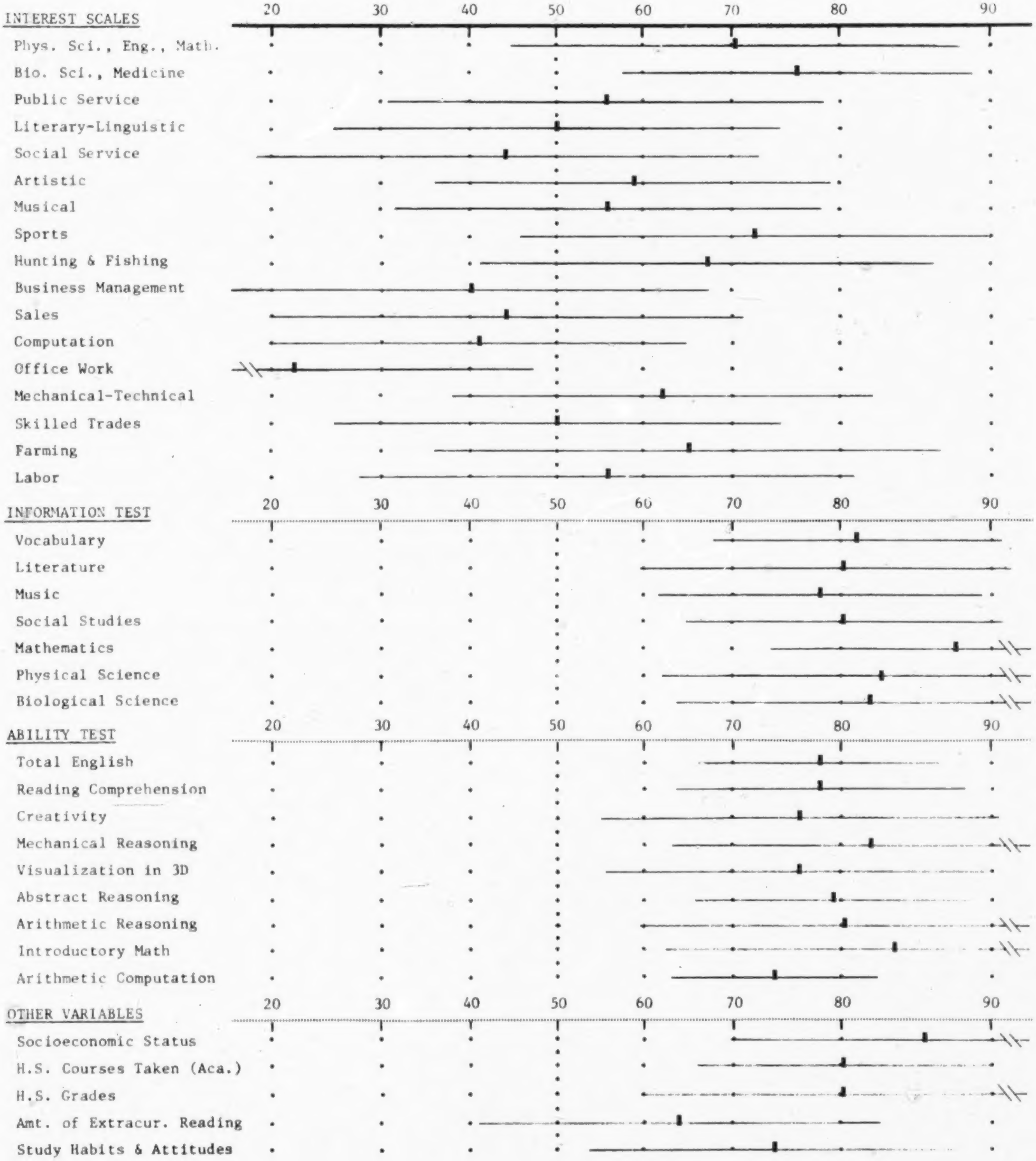
Others

General: High (86th percentile) in socioeconomic status; low (64th percentile) in extracurricular reading.

Specific: High (74th percentile) in maturity; 68th percentile in self-confidence; 56th percentile in sociability, social sensitivity, and self-perception of reading skills.

PHYSICAL THERAPIST (physiotherapist)

(Female - n = 66)



SPECIALIZED THERAPIST (Miscellaneous)

Importance: Relieve suffering and disability by application of scientific principles.

Training: Amount of training needed dependent on type of therapy and nature of job. Speech therapist often trained as teacher (see pp. 124 and 122). Occupational therapist must have degree or certificate in occupational therapy (certificate for persons who already have bachelor's degree). Training includes 6-9 months of supervised clinical work. Can also get occupational therapist's training in armed forces. Occupational therapist must have good knowledge of arts and crafts.

Inhalation therapist needs minimum of high school graduation and a year's on-the-job training. Graduation from inhalation therapist's course (18 months to 4 years) desirable. 4-year course gives bachelor's degree. Courses combine theory and practice.

Varying requirements for other kinds of therapist.

Work Activities: Speech therapist works with people who have speech difficulties or who through accident or illness have lost the power of speech. Also teaches deaf children to talk.

Occupational therapist works as member of medical team to improve patient's morale and physique through work therapy. For example, may have arthritic patient do weaving to exercise fingers. Supervises aides, teaches medical and nursing students principles of occupational therapy.

Inhalation therapist uses inhalation to treat patients with respiratory ailments or whose breathing is affected by accident, heart attack, etc. Gives oxygen, aerosols to dissolve congestion, etc.

Many other types of therapist both in and out of hospital work.

Outcomes: Improved condition of patient.

Supervision; Social Relations: Most therapists work as members of a therapeutic team, often headed by a physician or other expert. Capacity for teamwork and good relationship with patients necessary.

Salary; Other Benefits: Vary widely according to nature of job and place of employment.

Speech therapists employed by schools earn teachers' salaries. In 1970 occupational therapists of staff and senior status earned $8,000-$10,000; those in high administrative positions $13,000-$18,000. Beginning occupational therapists going to work for federal government started at $7,294.

In 1970 inhalation therapists started at about $555 per month; could work up to $830. Inhalation therapists going to work for federal government started at $4,125-$5,212.

Role of Sexes: Both men and women work as speech therapists. Nine-tenths of occupational therapists women in 1970. Most inhalation therapists are men, but women are now entering the field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (73rd percentile) in physical science, engineering and mathematics, biological science and medicine, and literary-linguistic; low (42nd percentile) in computation, and labor; very low (26th percentile) in office work.

Information

General: Average around the 76th percentile on information scores; highest (80th percentile) in mathematics; lowest (73rd percentile) in biological science.

Specific: High (80th percentile) in art; 66th percentile in health.

Abilities

General: Around the 72nd percentile on ability scores; highest (78th percentile) in introductory mathematics; lowest (67th percentile) in three-dimensional visualization, abstract reasoning, and arithmetic computation.

Specific: 64th percentile in memory for words.

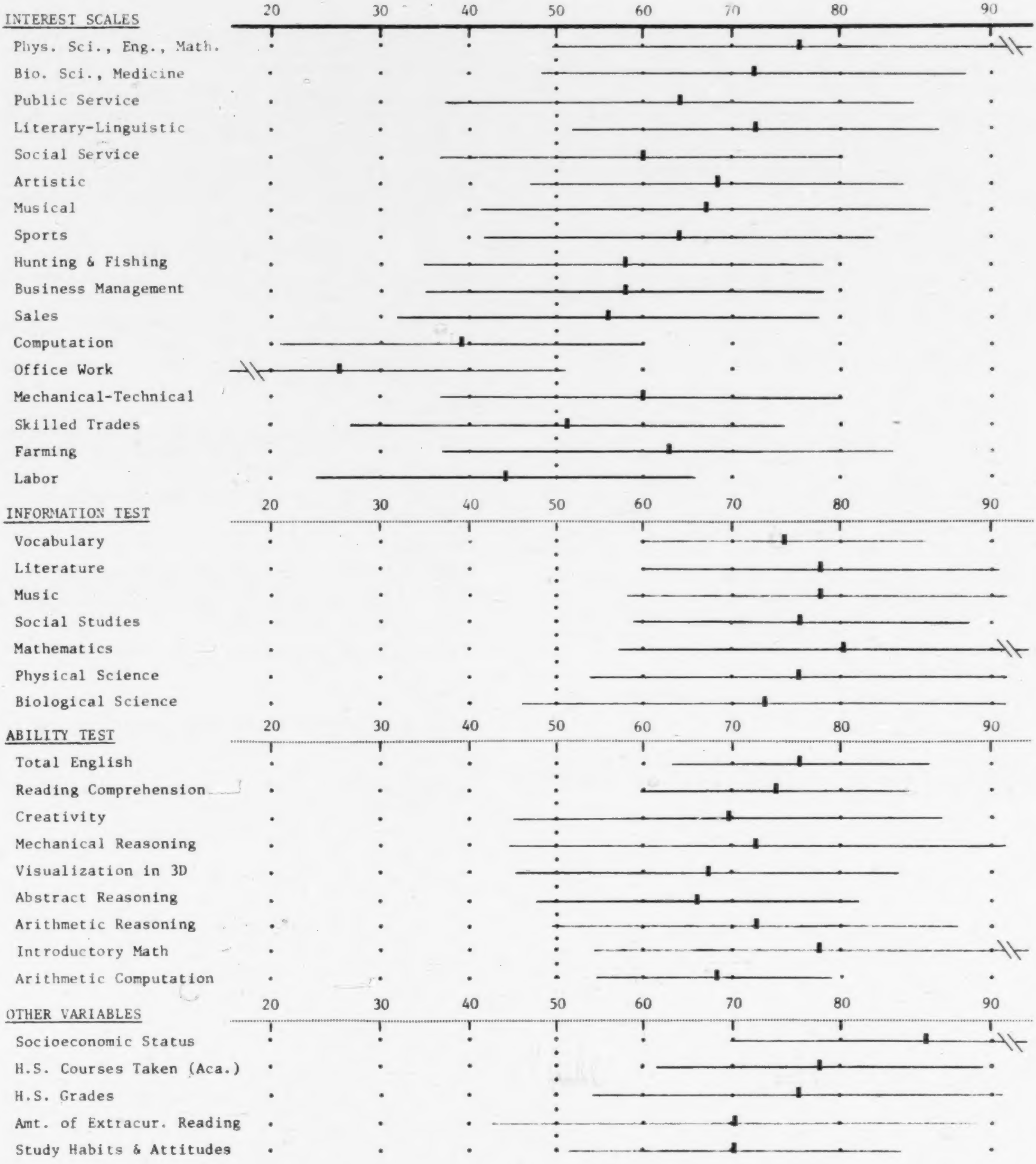
Others

General: High (86th percentile) in socioeconomic status; low (70th percentile) in extracurricular reading, and study habits and attitudes.

Specific: 58th percentile in sociability, and social sensitivity; 75th percentile in self-confidence, and maturity; 69th percentile in self-perception of reading skills.

SPECIALIZED THERAPIST (Miscellaneous)

(Female - n = 70)



SURVEYOR

Importance: Correctly determined boundaries are essential to our system of land ownership. Surveying is an essential initial process in all major construction work.

Training: Usually gotten through post-high school courses plus on-the-job training. Courses often obtainable through extension or correspondence school. For photogrammetry (surveying by photographs), bachelor's degree in engineering or the physical sciences is usually necessary.

It is sometimes possible to begin with on-the-job training and take courses later.

All states require land surveyors responsible for locating boundaries to be licensed. Requirements are passing examination, plus experience or formal training.

Good health and liking for outdoor work are prerequisites.

Work Activities: Provide information on measurements of construction sites, locate land boundaries, collect information for maps. Must determine exact measurements, elevations, distances. Supervisor of surveying party records and verifies information, makes mathematical calculations, prepares maps and reports. His surveying party includes instrumentmen, who operate the instruments, chainmen who measure distances, and rodmen who measure elevations, distance, and directions.

Surveyors may specialize in highway surveys, land surveys, topographic surveys (surveys of the shape of the earth's surface and land features of a certain area). Geodesists measure very large areas (as Antarctica); photogrammetrists make maps and measure terrain through use of photographs.

About a third of all surveyors work for government agencies. Many also for construction companies, petroleum companies, etc.

Outcomes: Correctly located boundaries; correctly measured elevations, distances, land shapes, and directions; accurate maps and reports.

Supervision: Social Relationships: Surveyors work as members of a team. Field party supervisor must have qualities of leadership.

Salary; Other Benefits: In 1970 field party chiefs going to work for federal government started at $7,300 or $8,100 a year. Most field party chiefs earned $8,000-$10,000 a year.

Role of Sexes: Because of strenuous outdoor work involved, surveying is mainly a man's field, but some of the work is done in offices.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (58th percentile) in mechanical-technical, skilled trades, and farming; lowest (37th percentile) in literary-linguistic, social service, and business management.

Information

General: Average around 50th percentile on information scores; highest (58th percentile) in mathematics; lowest (44th percentile) in music.

Specific: 56th percentile in engineering, and outdoor activities.

Abilities

General: Around the 52nd percentile on ability scores; highest (59th percentile) in creativity, and introductory mathematics; very low (26th percentile) in arithmetic computation.

Specific: 56th percentile in two-dimensional visualization.

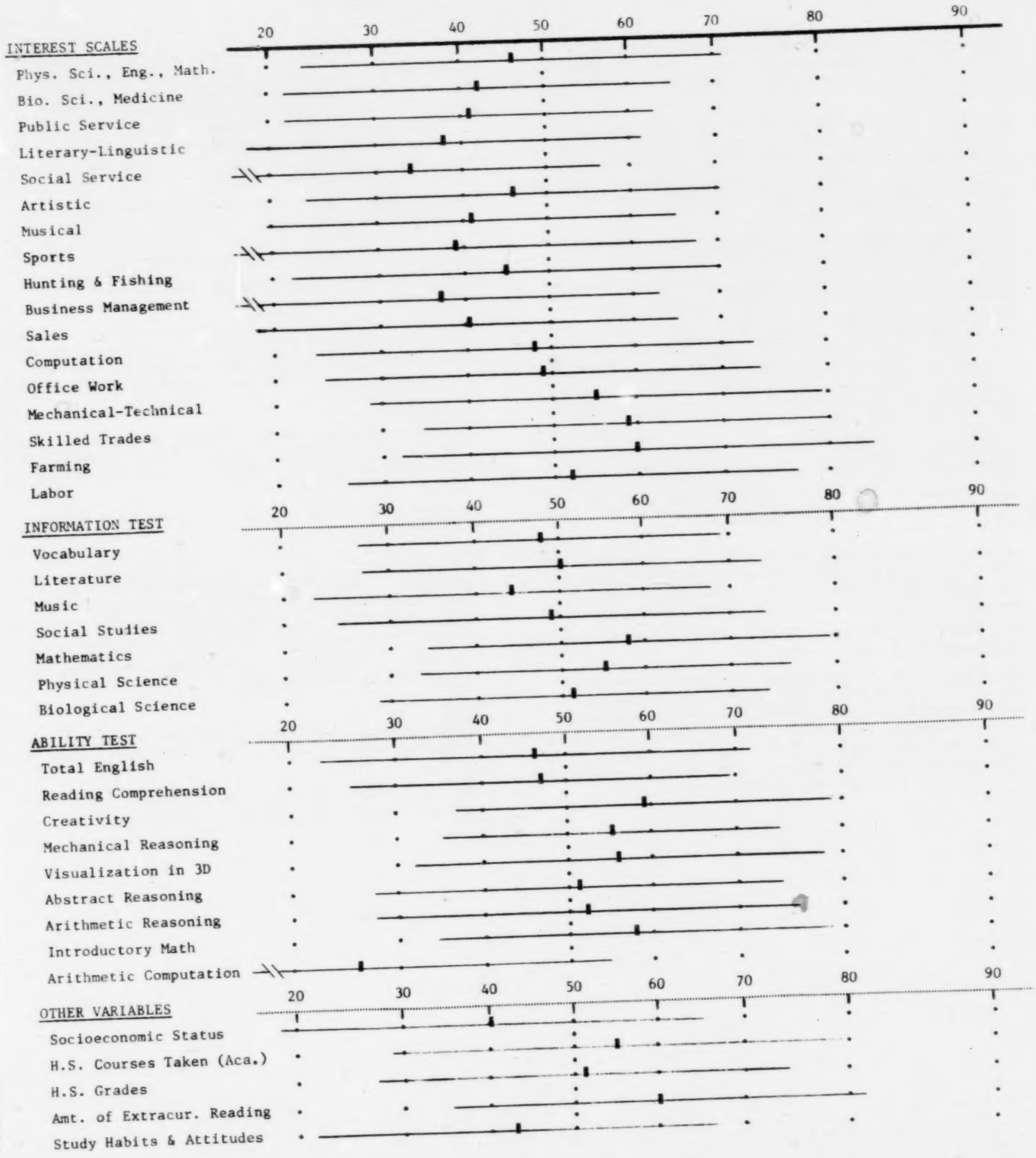
Others

General: High (60th percentile) in extracurricular reading; low (40th percentile) in socioeconomic status.

Specific: 42nd percentile in sociability, and self-perception of reading skills.

SURVEYOR

(Male - n = 70)



TECHNOLOGIST - Medical, Dental

Importance: Technologists needed to perform tasks too difficult for technicians, to apply scientific knowledge as well as skills, and to supervise technicians and assistants.

Training: For medical technologists, four years of college usually required, including training program in medical technology usually taking 12 months. For many jobs, certification following examination by Board of Medical Technologists required. In some states, licensing necessary.

For dental technologists, training and/or experience beyond that of dental technicians (see p. 198).

Work Activities: Medical technologists perform the more difficult laboratory tests, including chemical analysis and microscopic examination of fluids, cultures, and tissues. In large laboratory, may specialize in one particular area. May do research, teaching, or administration. May be X-ray technologists, anaesthetists, opticians. Work in hospitals, laboratories, research institutions, U. S. Public Health Service, etc.

Dental technologists perform the more difficult and non-typical constructions; supervise technicians.

Technologist differs from technician in that technologist applies scientific knowledge as well as knowledge of technique.

Outcomes: For medical technologist, accurate information concerning the substance or structure examined, for physician or other superior; medical procedures carried out; proper running of section administered.

For dental technologist, constructions properly made and supervisory duties fulfilled.

Supervision; Social Relations: Medical technologist may be subordinate to higher medical technologist, administrator, or physician; may supervise other laboratory workers. Two-fifths of all medical laboratory workers technologists in 1970. Dental technologist may be subordinate to higher technologist or administrator; work indirectly supervised by dentists.

Salary; Other Benefits: In 1970, beginning medical technologists employed by federal government started at $6,548. If had experience, high grades, or graduate study paid $8,098. Average starting salary $7,500. Salaries usually higher on West Coast and in large cities. 40-hour week general; some night and weekend duty. Pay of dental technologists higher than that of dental technicians; see p. 198.

Role of Sexes: Women more numerous in medical than in dental laboratory work.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (83rd percentile) in physical science, engineering and mathematics, and biological science and medicine; high (70th percentile) in mechanical-technical; low (29th percentile) in office work.

Information

General: Average around 76th percentile on information scores; highest (85th percentile) in mathematics and physical science; lowest (74th percentile) in music.

Specific: 72nd percentile in scientific attitude, and health.

Abilities

General: Around 74th percentile on ability scores; very high (84th percentile) in mathematics; lowest (69th percentile) in three-dimensional visualization, abstract reasoning, and arithmetic computation.

Specific: 70th percentile in memory for words; 65th percentile in table reading.

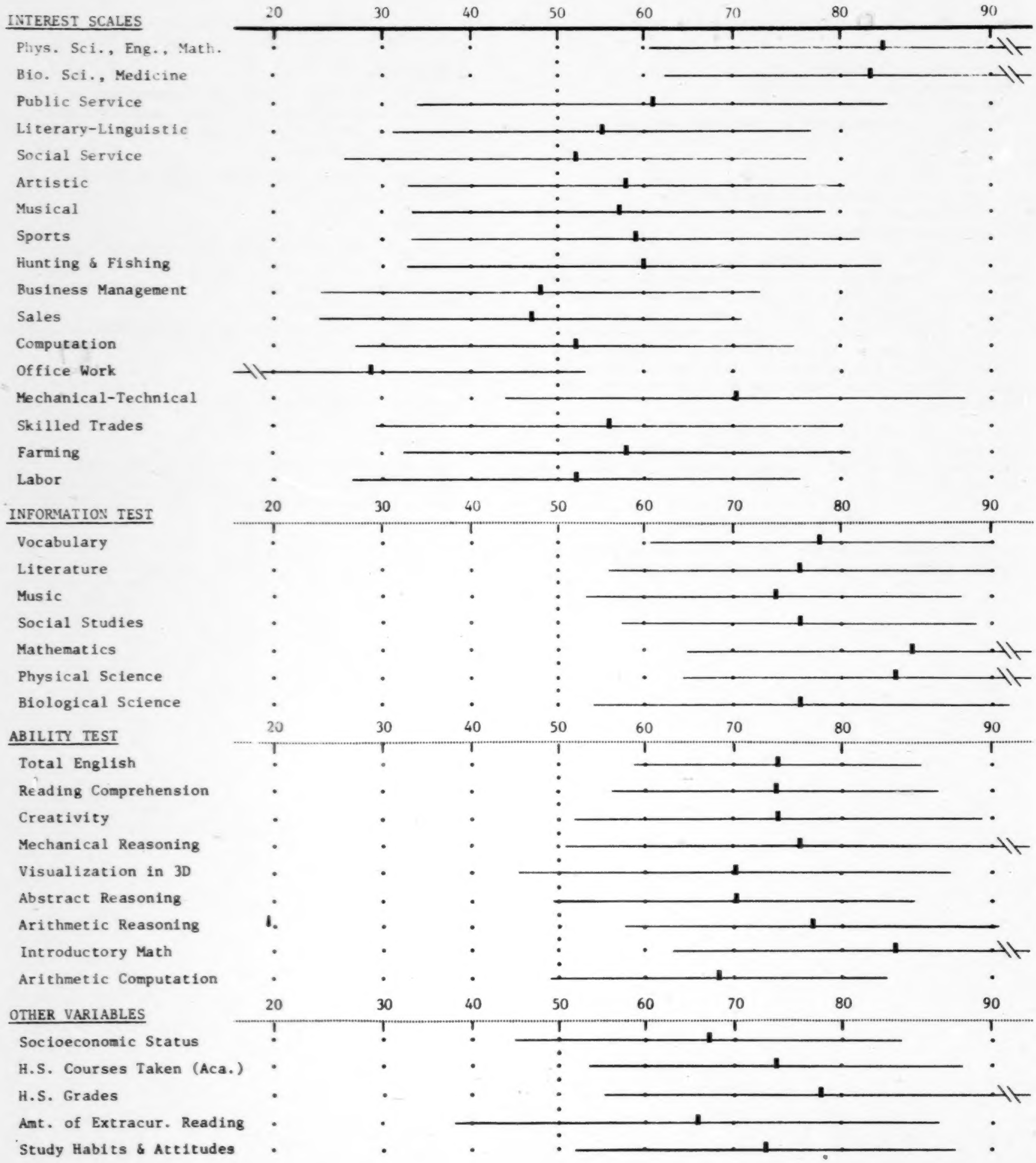
Others

General: High (78th percentile) in high school grades; low (66th percentile) in extracurricular reading.

Specific: 48th percentile in sociability; 58th percentile in self-perception of reading skills.

TECHNOLOGIST - Medical, Dental

(Female - n = 302)



CHAPTER 10

CAREER GROUP 8

Proprietor, Sales

The following occupations are included in Career Group 8:

- Clerk/Sales (Females) (a)
- Farming/Ranching - Owner (B)
- Manager/Sales (C)
- Proprietor, Contractor (in business for self) (D)
- Salesman
  - Auto (E)
  - Insurance (F)
  - Other (not elsewhere classified) (G)
  - Real Estate (H)
- Supervisor/Business (I)

These workers are responsible for filling the gap between the manufacturers of products and the customers who need and use those products. Salesmen and saleswomen assist customers in selecting and buying a certain type of product. Supervisors are responsible for the work of an entire staff of salesmen or an office staff. Some workers in this group combine these two responsibilities when they go into business for themselves.

Specific training or study is generally not required for most of the workers of Career Group 8, other than the training and experience which they receive on the job.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (55th percentile) in sales; lowest (41st percentile) in hunting and fishing.

Information

General: Average around 51st percentile on information scores; highest (56th percentile) in music, and mathematics; lowest (50th percentile) in vocabulary, and social studies.

Specific: High (58th percentile) in accounting, business and sales.

Abilities

General: Around the 49th percentile on ability scores; highest (55th percentile) in creativity, and introductory math; lowest (42nd percentile) in arithmetic computation.

Specific: 58th percentile in table reading; 55th percentile in memory for words.

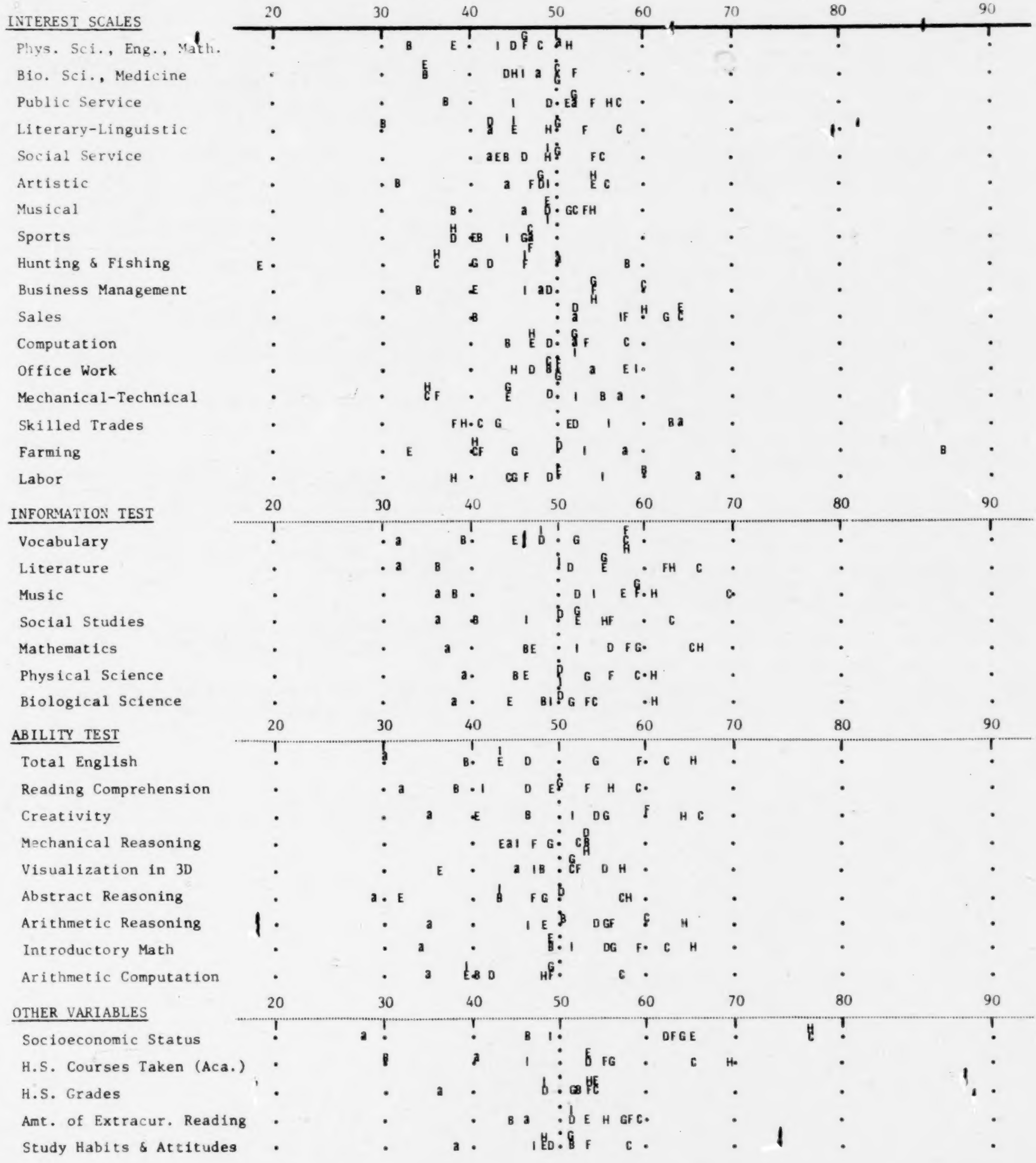
Others

General: High (63rd percentile) in socioeconomic status; low (50th percentile) in study habits and attitudes.

Specific: High (50th percentile) in sociability, and self-confidence; 46th percentile in self-perception of reading skills; 46th percentile in social sensitivity.

CAREER GROUP 8

Proprietor, Sales



CLERK - Sales

Importance: Necessary for operation of retail establishments, restaurants, etc.; represent proprietor in contact with customer; accurate performance of work necessary for good customer relations.

Education: High school graduates preferred. Courses in commercial arithmetic, typing, business machines, etc. useful. Some high schools allow student to work part-time to get on-the-job training while still in school. On-the-job training often given after employment. College education not necessary for advancement in these fields.

Work Activities: Sales clerk gets customer interested in store's merchandise, answers questions about it, shows kinds available, helps customer decide, makes out sales slips, makes change, gives receipts, keeps stock in order, etc. Cashier or checker determines what customer owes in self-service stores, receives payment and makes change, may bag merchandise, records transaction. Cashiers, checkers, sales clerks use cash registers, record transactions. Cashiers or checkers who work in hotels, hospitals, etc., keep running record of charges being incurred by customer.

Outcomes: Transactions accurately done and recorded; sales made and customer left in mood for future purchases.

Supervision; Social Relations: Supervision by immediate superior; indirectly by customer. Good social relations with other employees and with customers necessary.

Salary; Other Benefits: Sales clerk may be paid by salary, commission, or a combination of the two. In 1970, usually began at $1.60 per hour, but experienced salesworkers may earn $3 hour or more. Often allowed discount on own purchases from store.

In 1970 cashiers and checkers usually started at $1.60 hour or less. In unionized jobs cashiers and checkers might earn over $2 hour; supermarket checkers often earn over $3.

For sales clerks, cashiers, and checkers evening, weekend work often necessary.

Role of Sexes: Three-fifths of sales clerks women in 1970, but more men than women selling furniture, household appliances, automobiles, etc. In 1970, about 90% of cashiers women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (66th percentile) in skilled trades, and labor; lowest (42nd percentile) in literary-linguistic, and social service.

Information

General: Average around 36th percentile on information scores; highest (39th percentile) in physical science; low (32nd percentile) in vocabulary, and literature.

Specific: 40th percentile in accounting, business and sales.

Abilities

General: Around the 35th percentile on ability scores; highest (45th percentile) in mechanical reasoning, and three-dimensional visualization; lowest (29th percentile) in abstract reasoning.

Specific: 38th percentile in memory for words, and table reading.

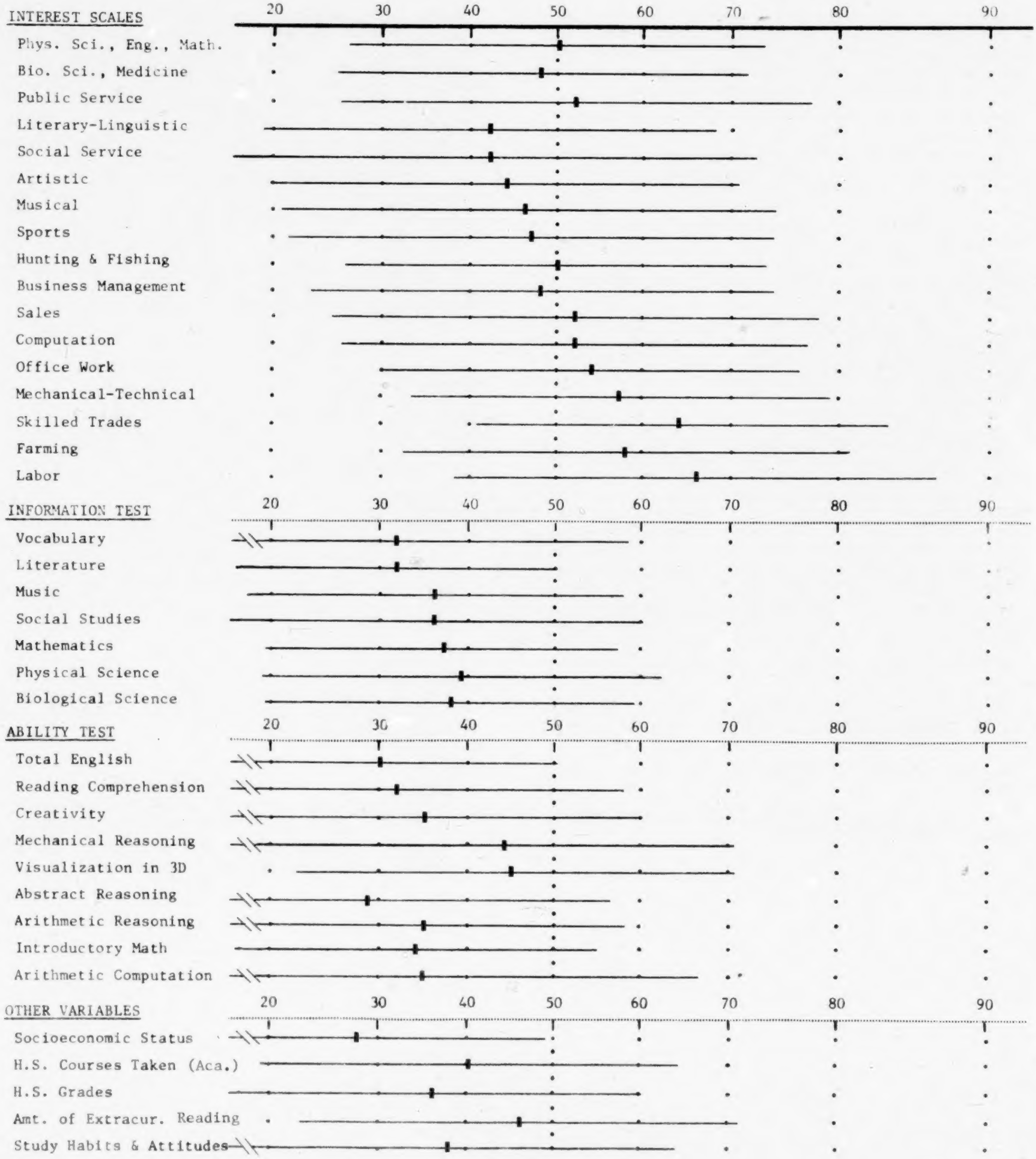
Others

General: High (46th percentile) in extracurricular reading; low (28th percentile) in socioeconomic status.

Specific: 42nd percentile in sociability, social sensitivity, and self-confidence.

CLERK - Sales

(Female - n = 107)



FARMING, RANCHING - Owner

Importance: Food and fiber production basic to all other industries. Agricultural efficiency makes possible the release of manpower to industry and service occupations. Increasing food production necessary to meet world's growing consumption demands.

Training: Future farm owner may take agricultural curriculum in high school in many rural areas. If he plans to engage in commercial farming usually attends agricultural college. Schools of agriculture offer short courses in special areas of farming. Adult education programs in agriculture may be offered locally by county agricultural agent. Extension courses offered by land-grant colleges. Youth organizations such as 4-H Club and Future Farmers of America provide training programs. Most farmers have had on-the-job training from childhood.

Good reading and arithmetic ability now necessary for farm owner, who must keep records for taxation purposes and to determine efficiency of various projects. Knowledge of farm machinery, ability to do some repairs, essential.

Work Activities: Work of farm owner usually differs from that of other farm worker chiefly in necessity of doing planning and record-keeping and making financial arrangements. Some farm owners do all of their own work; others are extensive employers of labor. Farm owner plans next season's crops, keeps track of market prices, buys seed and fertilizer, arranges for plowing, planting, tilling, harvesting, marketing. Cares for farm animals; determines profitable feeding formulas. Keeps track of government policy in regard to conservation grants, etc. Keeps up with new agricultural discoveries and processes. Keeps farm buildings, fences, roads in repair. Operates, cares for, and does simpler repairs to farm machinery. Farmer often assisted in these tasks by unpaid members of his family.

Many farmers now combine farming with paid jobs in nearby towns. Considerable capital required to be farm or ranch owner.

Outcomes: Profitable production of plant and animal products.

Supervision; Social Relations: Farm or ranch owner usually free of supervision.

Salary; Other Benefits: In general, owner receives greater rewards but must also have increasingly large investment. As example, 40-cow dairy farm in southeastern Wisconsin includes investment of about $63,000 in land and buildings, $18,000 in machinery and equipment, and $17,000 worth of livestock--$98,000. Net farm income to owner and unpaid members of his family, between $18,000 and $19,000. A tobacco farm in North Carolina, with 50 acres of cropland, might have $43,000 invested in land and buildings, $5,000 in machinery and equipment, and $680 in livestock. From this the farmer and his family would receive between $5,000 and $6,000.

No paid vacation, insurance, or fringe benefits.

Role of Sexes: Many women farm or ranch owners through inheritance but generally participate actively in farming only as co-workers with husbands.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest (87th percentile) in farming; high (61st percentile) in hunting and fishing, skilled trades, and labor; lowest (30th percentile) in literary-linguistic.

Information

General: Average around 40th percentile on information scores. Highest (48th percentile) in biological science; lowest (36th percentile) in literature.

Specific: Very high (80th percentile) in farming; 56th percentile in mechanics; 45th percentile in health, and outdoor activities.

Abilities

General: Around the 46th percentile on ability scores; highest (53rd percentile) in mechanical reasoning; lowest (39th percentile) in English, and reading comprehension.

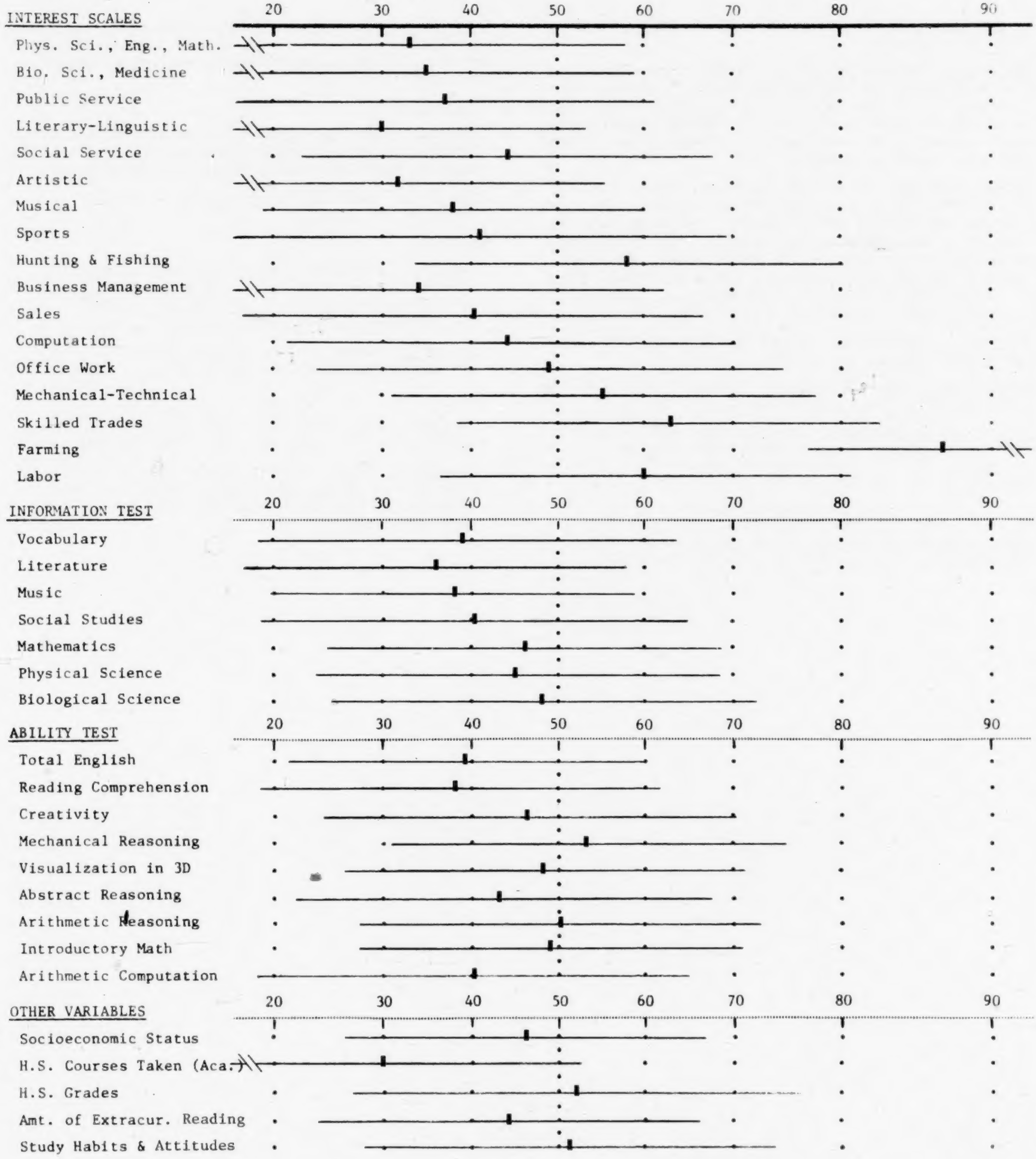
Others

General: High (52nd percentile) in high school grades, and study habits and attitudes; low (30th percentile) in academic orientation of courses.

Specific: 45th percentile in sociability; 38th percentile in self-perception of reading skills.

FARMING, RANCHING - Owner

(Male - n = 338)



MANAGER - Sales

Importance: Key figure in movement of goods and services to consumer.

Education: Depends on nature of job; varies from less than high school to engineering degree. Usually considerable on-the-job training during previous experience as salesman (sales managers nearly always former salesmen). Knowledge of items sold essential; also acquaintance with possible markets.

Work Activities: Supervises salesmen, maps out sales territories, may plan or approve advertising campaigns. Analyzes and reports market data. Advises on ways to make goods and services more salable. May be branch sales manager, regional sales manager, product sales manager, general sales manager, director of marketing, or vice-president of sales and marketing. Ratio of sales managers to salesmen about 1 to 10.

Outcomes: Higher sales through a more efficient sales force, advertising, and product improvement.

Supervision; Social Relations: Responsible to superior in organization for which he works.

Salary; Other Benefits: Salaries and benefits differ widely according to organization worked for.

Role of Sexes: Largely a man's occupation.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (60th percentile) in busines management, sales, and computation; lowest (36th percentile) in hunting and fishing, and mechanical-technical.

Information

General: Average around the 63rd percentile on information scores; highest (69th percentile) in music; lowest (54th percentile) in biological science.

Specific: High (67th percentile) in accounting, business and sales.

Abilities

General: Around the 59th percentile on ability scores; highest (66th percentile) in creativity; lowest (52nd percentile) in mechanical reasoning, and three-dimensional visualization.

Specific: Table reading at 67th percentile; 62nd percentile in memory for words.

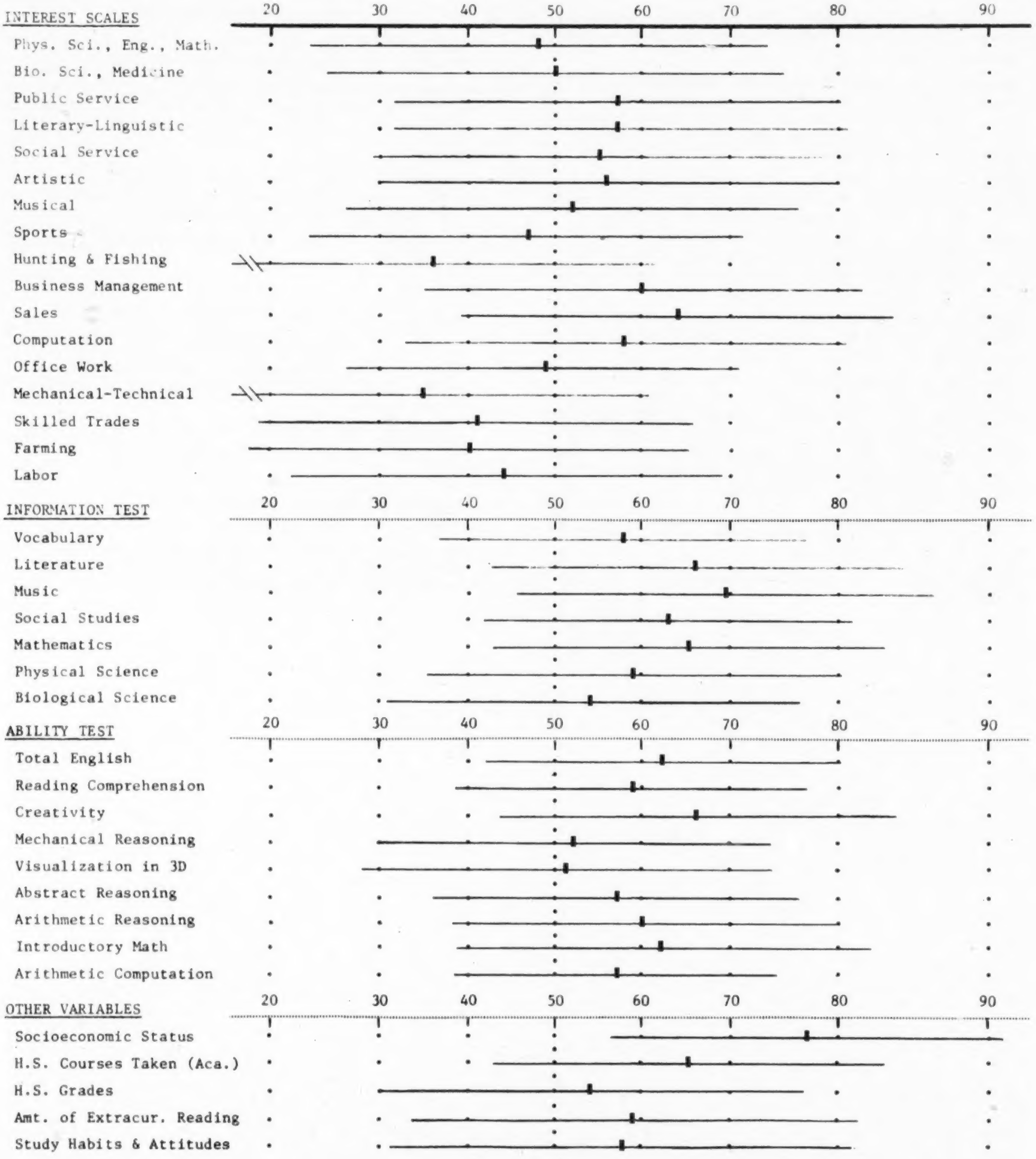
Others

General: High (77th percentile) in socioeconomic status; low (54th percentile) in high school grades.

Specific: High (67th percentile) in sociability; 62nd percentile in social sensitivity, and self-confidence; 55th percentile in self-perception of reading skills.

MANAGER - Sales

(Male - n = 243)



PROPRIETOR, CONTRACTOR (in business for self)

Importance: A major part of the system of organization in some occupational fields such as agriculture and the building trades.

Education: No formal educational requirements; efficiency at work and capacity for management more important. Some mathematical and clerical ability required for financial records, tax reports, etc. Thorough knowledge of field worked in most essential.

Work Activities: Proprietor supervises running of business, farm, or other productive unit. Contractor contracts to do a certain job, such as building a house, bridge, or school; may subcontract parts of job, such as roofing or plumbing, out to other contractors. Usually agrees to do job for a given amount; profit made if he does it for less.

Outcomes: For proprietor, profit after costs have been paid; for contractor, successful completion of job contracted for at less than the price agreed upon.

Supervision; Social Relations: For proprietor, no supervision from above except by government, unions, etc. For contractor, no supervision as long as terms of contract adhered to. Good social relations with subordinates essential for smooth operation of work. Contractor may cultivate good relations with persons who may possibly give him contracts.

Salary; Other Benefits: Incomes vary widely according to nature of work done and success in it. Benefits may be less than for employees.

Role of Sexes: Some women proprietors; few of them contractors.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (52nd percentile) in sales, and skilled trades; lowest (40th percentile) in literary-linguistic, sports, and hunting and fishing.

Information

General: Average around 50th percentile on information scores; high (56th percentile) in mathematics; low (48th percentile) in vocabulary.

Specific: 56th percentile in accounting, business and sales.

Abilities

General: Around the 53rd percentile on ability scores; highest (54th percentile) in creativity, mechanical reasoning, three-dimensional visualization, arithmetic reasoning, and introductory mathematics; lowest (42nd percentile) in arithmetic computation.

Specific: Table reading at 62nd percentile; 59th percentile in memory for words.

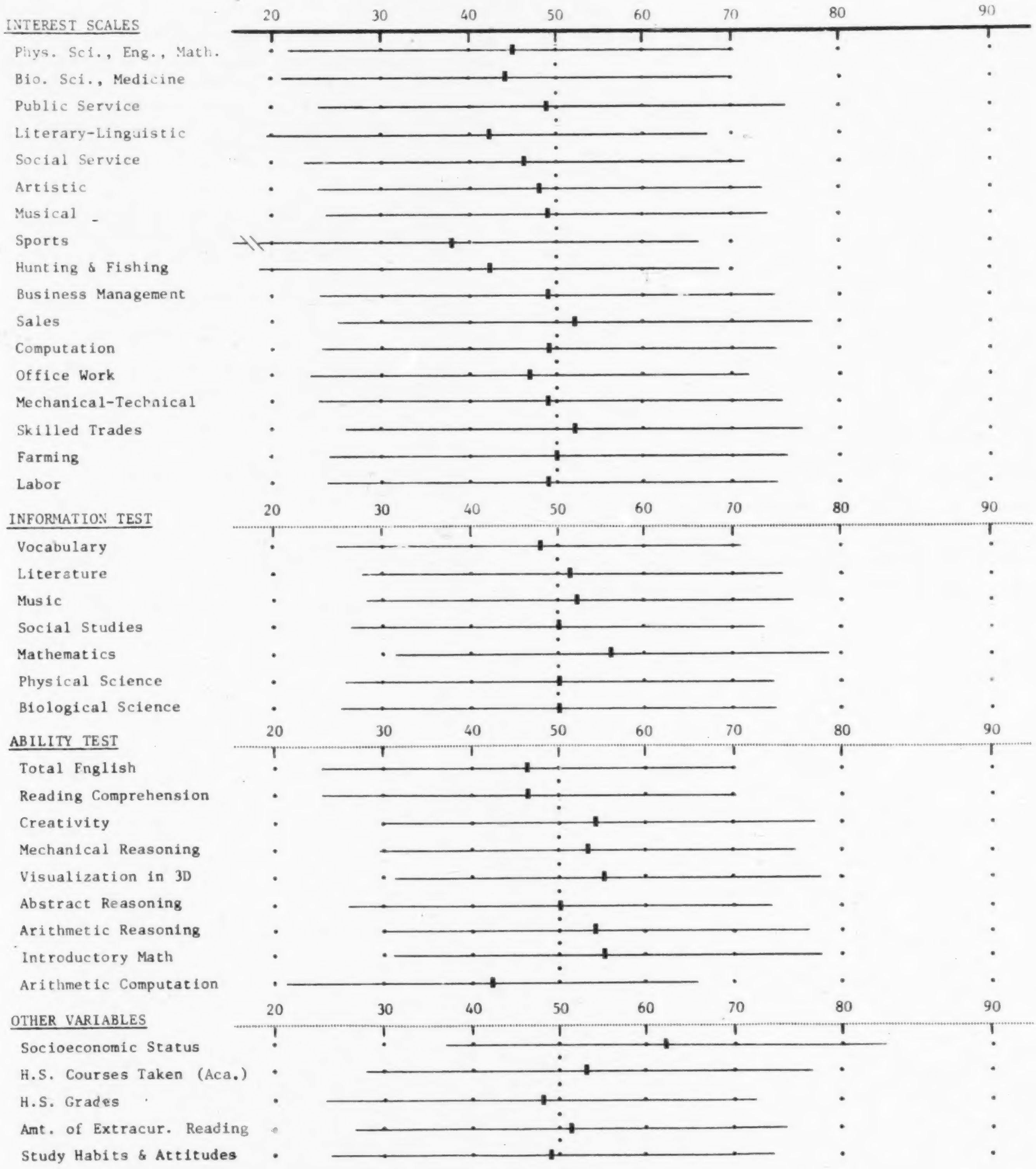
Others

General: High (62nd percentile) in socioeconomic status; low (48th percentile) in high school grades.

Specific: 54th percentile in sociability, social sensitivity, and self-confidence; 43rd percentile in self-perception of reading skills.

PROPRIETOR, CONTRACTOR (in business for self)

(Male - n = 811)



SALESMAN - Auto

Importance: Instrumental in getting cars from manufacturers or previous owners to persons in need of them.

Training: High-school diploma usually necessary. Courses in commercial arithmetic, psychology, etc., helpful. Previous sales experience desirable. Good appearance and manner necessary. Knowledge of cars desirable. Automobile salesman usually trained on the job. Sometimes take courses put on by manufacturers. Given help and advice by sales managers.

Work Activities: Talks to customers, selects cars that fit their needs, demonstrates them and discusses their good points. Quotes prices and trade-in allowances subject to approval of sales manager. May arrange financing and insurance. Registers cars and orders new license plates. Has car serviced and delivered. Keeps in touch with customer in case of later sales. Locates possible customers through contacts.

About one-fifth of auto salesmen work for used-car dealers; most others sell both new and used cars.

Outcomes: Automobiles sold.

Supervision; Social Relationships: Usually works for sales manager or, in small business, for proprietor.

Salary; Other Benefits: Usually works on commission, though some on straight salary or at guaranteed minimum. In 1969 automobile salesmen averaged $193 a week. Evening and weekend work usually necessary.

Role of Sexes: Nearly all automobile salesmen are men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (61st percentile) in sales, and office work; lowest (38th percentile and below) in natural sciences, hunting and fishing (20th percentile) and farming.

Information

General: Average around 47th percentile on information scores; highest (57th percentile) in music; lowest (45th percentile) in vocabulary, and biological science.

Specific: 63rd percentile in accounting, business and sales.

Abilities

General: Around the 43rd percentile on ability scores; highest (49th percentile) in reading comprehension, arithmetic reasoning, and introductory mathematics; lowest (32nd percentile) in abstract reasoning.

Specific: High (57th percentile) in memory for words; 36th percentile in table reading.

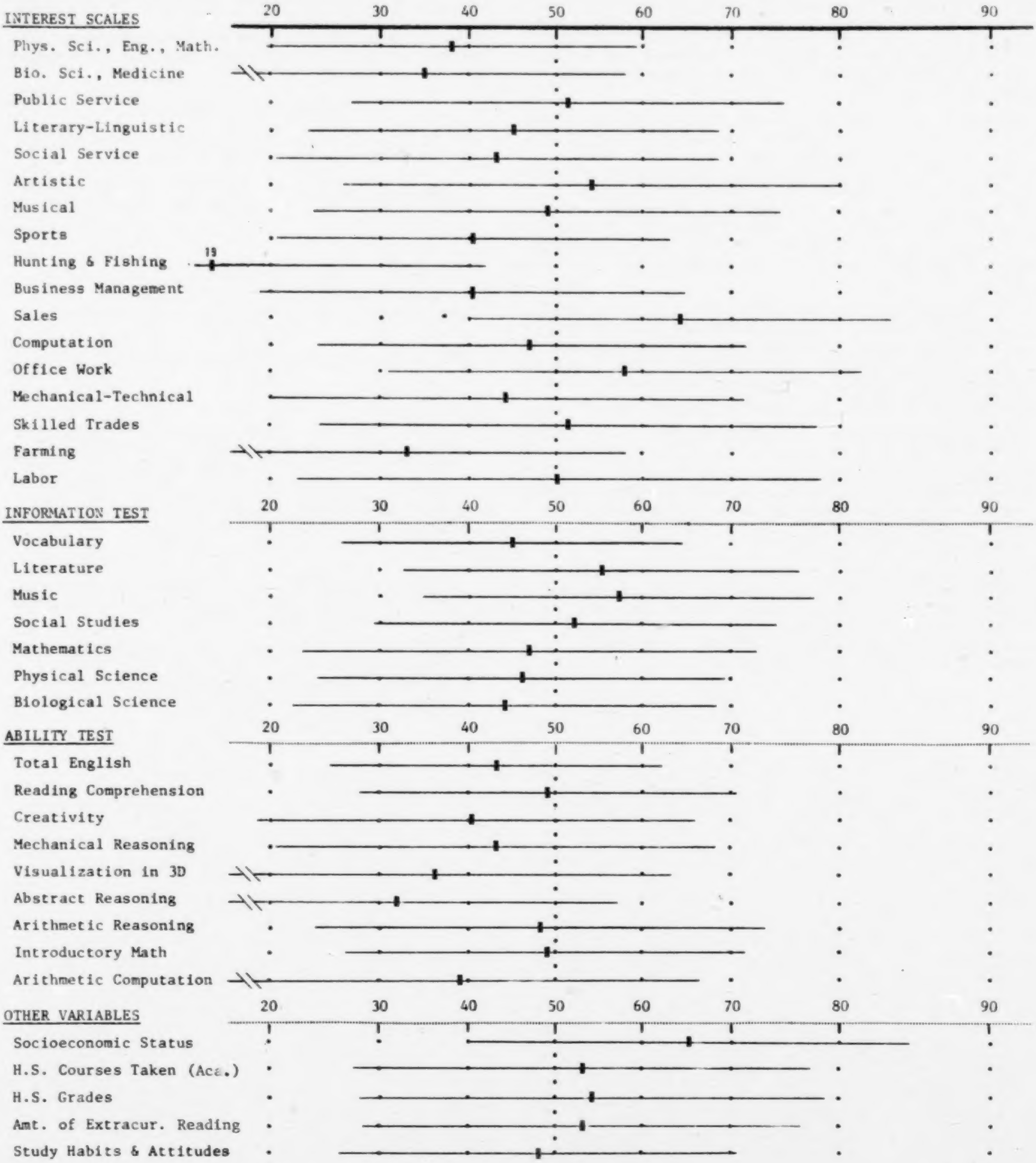
Others

General: High (65th percentile) in socioeconomic status; low (48th percentile) in study habits and attitudes.

Specific: 56th percentile in sociability; 46th percentile in self-confidence.

SALESMAN - Auto

(Male - n = 44)



SALESMAN - Insurance

Importance: Insurance protects individuals and organizations from financial disaster. Salesman very influential in getting people to provide themselves with insurance protection.

Training: No formal educational requirements but about half of new insurance salesmen have some college training. Courses in business, accounting, etc., and in liberal arts, helpful. Insurance organizations provide seminars, short courses, etc. On-the-job training usually provided after hiring. Life Underwriter Training Council offers 2-year training program. Insurance salesman needs good reading comprehension to understand conditions of policies. State examination and licensing usually required.

Work Activities: Salesman identifies prospects, studies their life situation, chooses insurance policies suitable to their needs, persuades them to buy. Changes type of policy when necessary as client's life situation changes. May collect premiums. Life insurance now frequently combined with health and retirement insurance.

Outcomes: Sale of insurance policies and satisfaction of customers.

Supervision; Social Relations: Agent at first works under supervision of experienced sales personnel. Later under general supervision of office or company. Good social relations with clients and prospective clients important.

Salary; Other Benefits: Beginning agent often given salary or advance on commissions but most experienced agents paid on commission basis. Income from commissions may range from $8,000 to $20,000; sometimes $30,000. Pay own automobile and office expenses. Often work evenings and weekends.

Role of Sexes: Nine out of ten insurance agents and brokers men in 1970, but women sometimes sell insurance as part-time work.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (58th percentile) in sales; lowest (37th percentile) in mechanical-technical, and skilled trades.

Information

General: Average around the 58th percentile on information scores; highest (62nd percentile) in literature; lowest (53rd percentile) in biological science.

Specific: 59th percentile in accounting, business and sales.

Abilities

General: Around the 54th percentile on ability scores; highest (59th percentile) in English, creativity, and introductory mathematics; lowest (47th percentile) in mechanical and abstract reasoning.

Specific: High (68th percentile) in table reading; 62nd percentile in memory for words.

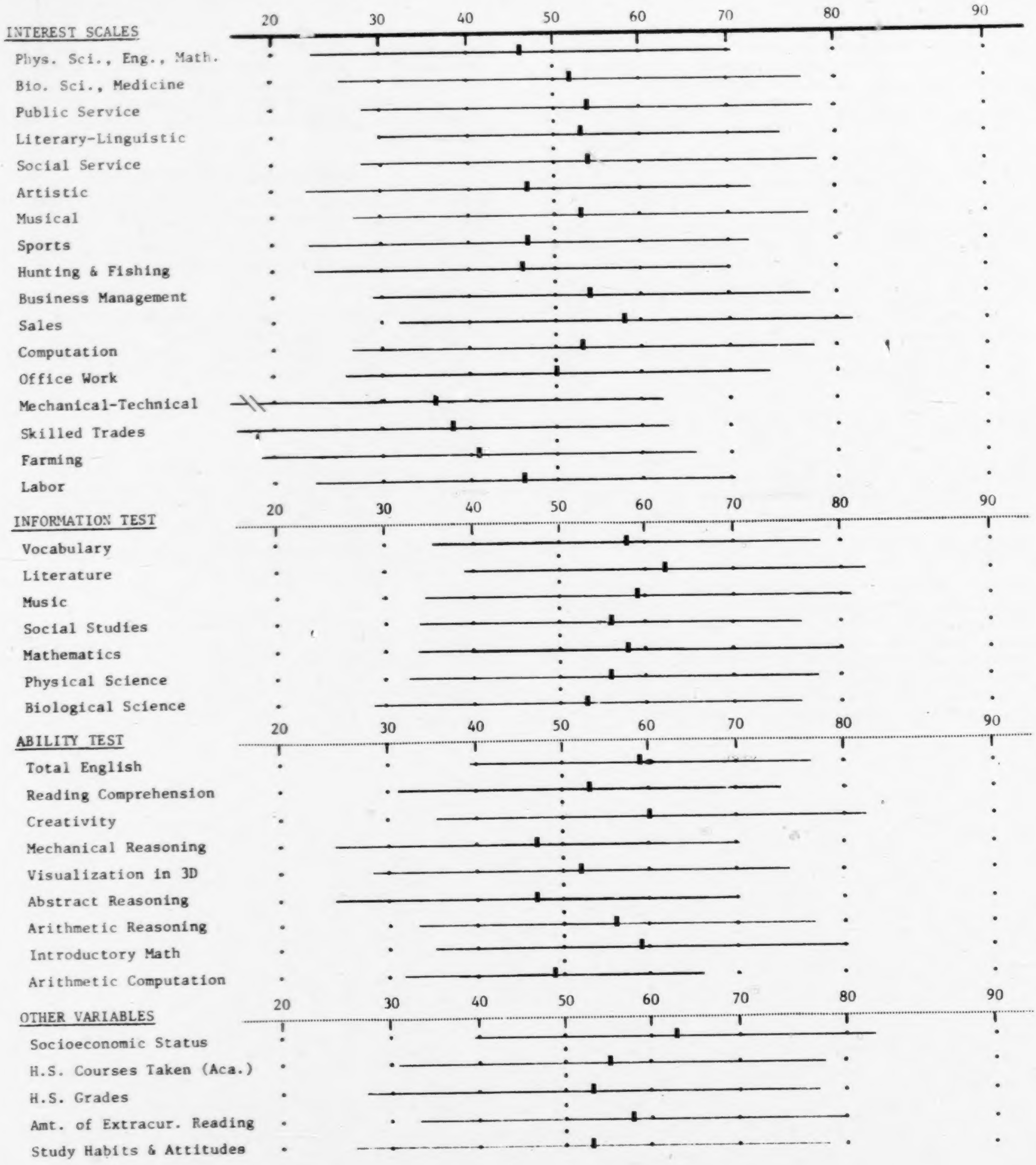
Others

General: High (63rd percentile) in socioeconomic status; low (53rd percentile) in high school grades, and study habits and attitudes.

Specific: High (61st percentile) in social sensitivity; 58th percentile in sociability, and self-confidence; 51st percentile in self-perception of reading skills.

SALESMAN - Insurance

(Male - n = 198)



SALESMAN - Other (not elsewhere classified)

Importance: Salesmen move goods from manufacturer to consumer and act as middlemen between providers of services and those in need of services.

Training: Formal requirements vary widely, from less than high school up to college degree in economics, depending on kind of selling involved. In general, business courses helpful. Much of training takes place on the job. In some jobs months or years of on-the-job training required; in others only a few days.

Work Activities: Learns qualities, characteristics, and uses of what he has to sell, price range, performance expectation. In many types of selling must locate prospective clients. In some arranges financing, etc. Determines needs of client and how best to meet them; persuades client that he wants to buy. Often responsible for keeping stock on hand and properly arranged. May deal with complaints and returned goods. Salesmen may sell to wholesalers, stores, industries, or directly to individuals.

Outcomes: Completed sales, preferably to customers who will be satisfied to have bought.

Supervision; Social Relations: Usually supervised by immediate superior or by sales manager. Social relations with possible clients particularly important for salesman who must locate prospective customers.

Salary; Other Benefits: Wide differences according to nature of job and success of salesmen.

In 1970, manufacturers' salesmen began at about $8,500 a year plus commissions and bonuses. Many experienced salesmen earned $16,000-$32,000. Securities salesmen earned $400-$500 during training. Full-time securities salesmen generally earned $8,000-$17,000 a year in 1970. Experienced wholesale trade salesworkers averaged $15,000 a year. Some sales incomes, however, very low. Other benefits depend on place of employment.

Role of Sexes: In 1970 two out of five sales workers were women, but these worked mainly in retail stores (see p. 214). About 10% of manufacturers' salesmen are women; they sell chiefly food products. Majority of securities salesmen are men. Most wholesale trade salesworkers are men.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (62nd percentile) in sales; lowest (40th percentile) in hunting and fishing.

Information

General: Average around 53rd percentile on information scores; highest (59th percentile) in music, and mathematics; lowest (52nd percentile) in vocabulary, social studies, and biological science.

Specific: 59th percentile in accounting, business and sales.

Abilities

General: Around the 51st percentile on ability scores; highest (55th percentile) in creativity, arithmetic reasoning, and introductory mathematics; lowest (48th percentile) in abstract reasoning.

Specific: Table reading at 60th percentile; 57th percentile in memory for words.

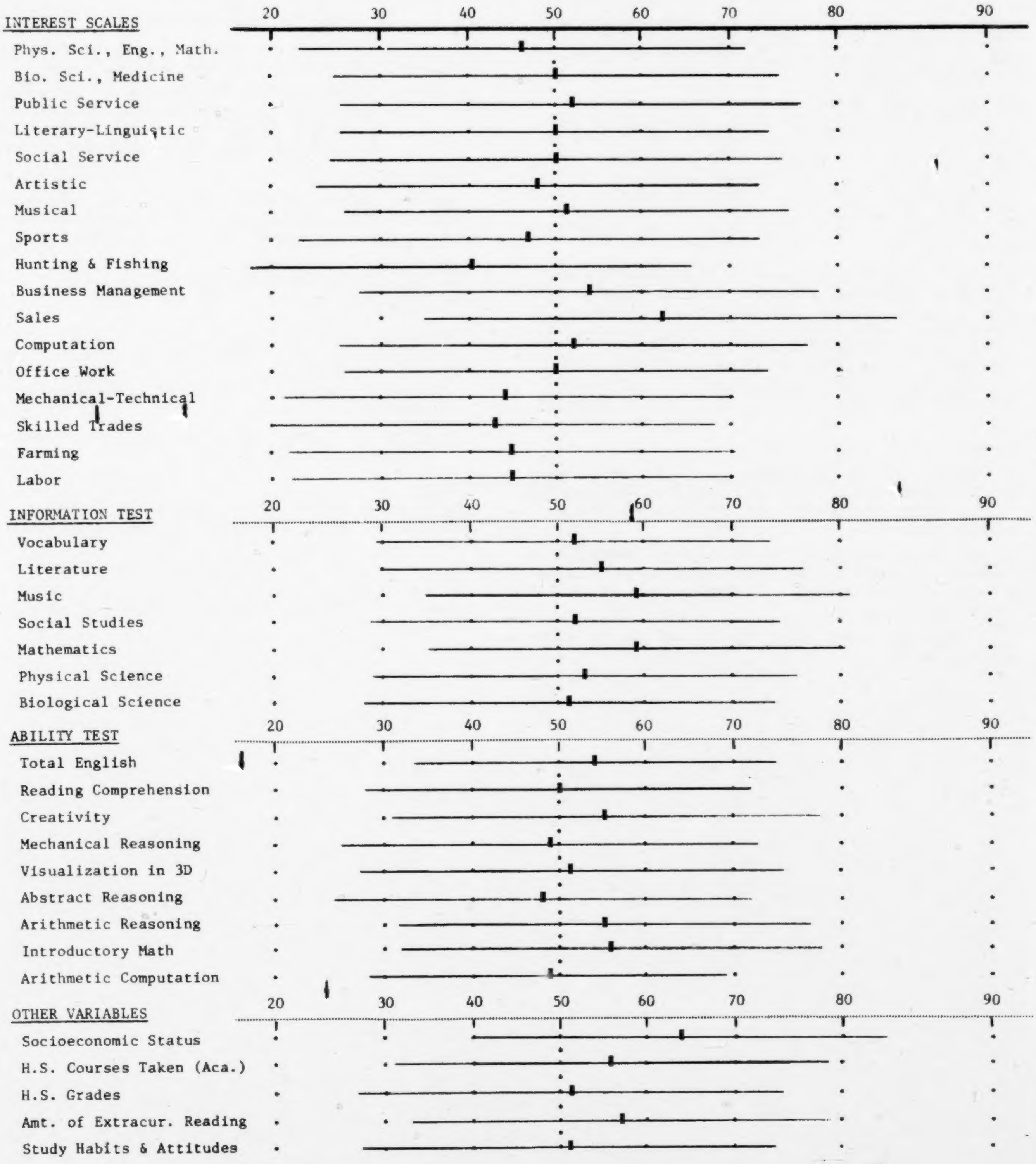
Others

General: High (64th percentile) in socioeconomic status; low (51st percentile) in high school grades, and study habits and attitudes.

Specific: High (62nd percentile) in sociability; 58th percentile in social sensitivity, and self-confidence.

SALESMAN - Other (not elsewhere classified)

(Male - n = 961)



SALESMAN - Real Estate

Importance: Brings seller of real estate and person who wants to buy it in contact with each other. Through knowledge of available offerings helps buyer find what he needs.

Training: High school graduates usually preferred. Most have some college training. Courses in business law, architectural drawing, economics, etc. useful. Real estate subjects can be studied in college, junior college, university. May take correspondence courses, attend special real-estate training institutes. Beginning salesmen usually work for a time under an experienced salesman. All states require licensing based on examination.

Work Activities: Gets owners to list properties for sale with real-estate company. Contacts prospective buyers; shows property, provides needed information about taxes, zoning, etc. Closes sale, arranges for loans, title search, etc. Must know community thoroughly. May specialize in some particular kind of property, as homes, farms, commercial buildings. Must know facts relevant to value of type of property sold.

Outcomes: Real estate sold.

Supervision; Social Relationships: Works under experienced salesman then under real estate broker. Social relationships important in getting listings and contacting customers.

Salary; Other Benefits: Usually paid by commission. Incomes vary widely. Many earn $7,000-$12,000 a year. Usually provides own car. Evening and weekend work often necessary.

Role of Sexes: About two-fifths of real estate salesmen are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (60th percentile) in sales; high (55th percentile) in public service, artistic, musical, and business management; lowest (36th percentile) in hunting and fishing, and mechanical-technical.

Information

General: Average around 61st percentile on information scores; highest (66th percentile) in mathematics; lowest (55th percentile) in social studies.

Specific: 64th percentile in accounting, business and sales; 56th percentile in architecture.

Abilities

General: Around the 58th percentile on ability scores; highest (65th percentile) in English, creativity, arithmetic reasoning, and introductory mathematics; lowest (48th percentile) in arithmetic computation.

Specific: 60th percentile in memory for words; 51st percentile in table reading.

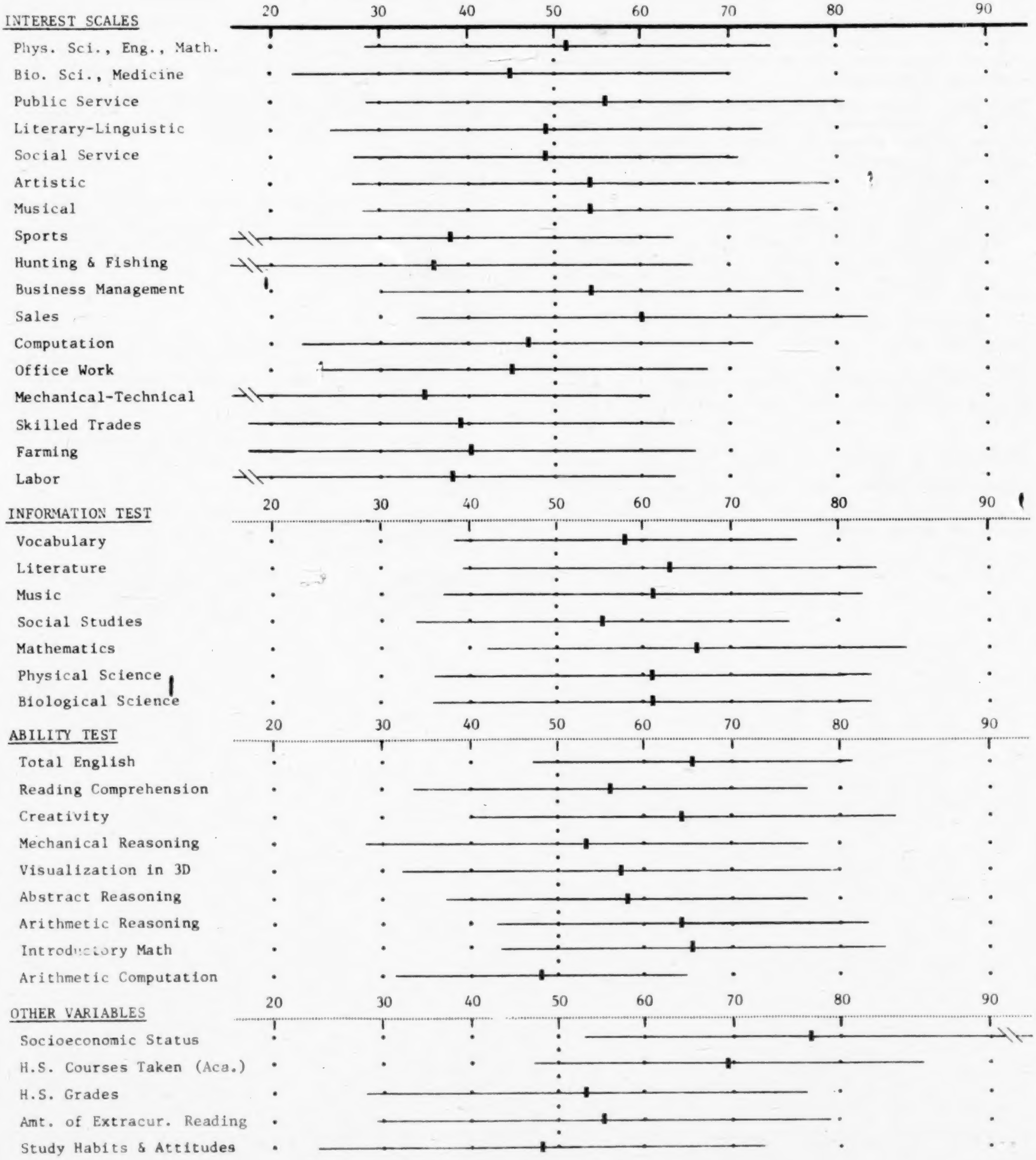
Others

General: High (69th percentile) in socioeconomic status; low (48th percentile) in study habits and attitudes.

Specific: High (61st percentile) in sociability; 59th percentile in social sensitivity, and self-confidence; 52nd percentile in self-perception of reading skills.

SALESMAN - Real Estate

(Male - n = 81)



SUPERVISOR - Business

Importance: Necessary for smooth and purposeful operation of work routine; acts as middleman between superiors and those below him; interprets and implements decisions of management.

Training: Formal education required depends on nature of job. In general should be equal to or above that of most of the persons supervised. On-the-job training particularly important since work methods and operations differ from place to place.

Work Activities: Keeps work running smoothly, keeps subordinates working, answers questions regarding work, sees that new employees receive proper instruction; rewards effort and achievement, advises on raises and promotions, keeps management informed as to needs for men, materials, changes in operative procedure.

Outcomes: Successful working of section, group, or department under his control.

Supervision; Social Relations: Responsible to superior in organization for whom he works; needs to have trust both of superior and of persons supervised. Needs to be able to correct people without antagonizing them.

Salary; Other Benefits: Widely varying according to rank, type of work done, and place worked for, but nearly always higher than that of persons supervised.

Role of Sexes: Nearly always men unless persons supervised are mainly women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (57th percentile) in sales, office work, and skilled trades; lowest (44th percentile) in physical science, engineering and mathematics, and sports.

Information

General: Average around 50th percentile on information scores; highest (54th percentile) in music; lowest (47th percentile) in social studies.

Specific: 50th percentile in accounting, business and sales.

Abilities

General: Around the 45th percentile in ability scores; highest (51st percentile) in creativity, and introductory mathematics; lowest (42nd percentile) in English, reading comprehension, abstract reasoning, and arithmetic computation.

Specific: High (57th percentile) in memory for words; 52nd percentile in table reading.

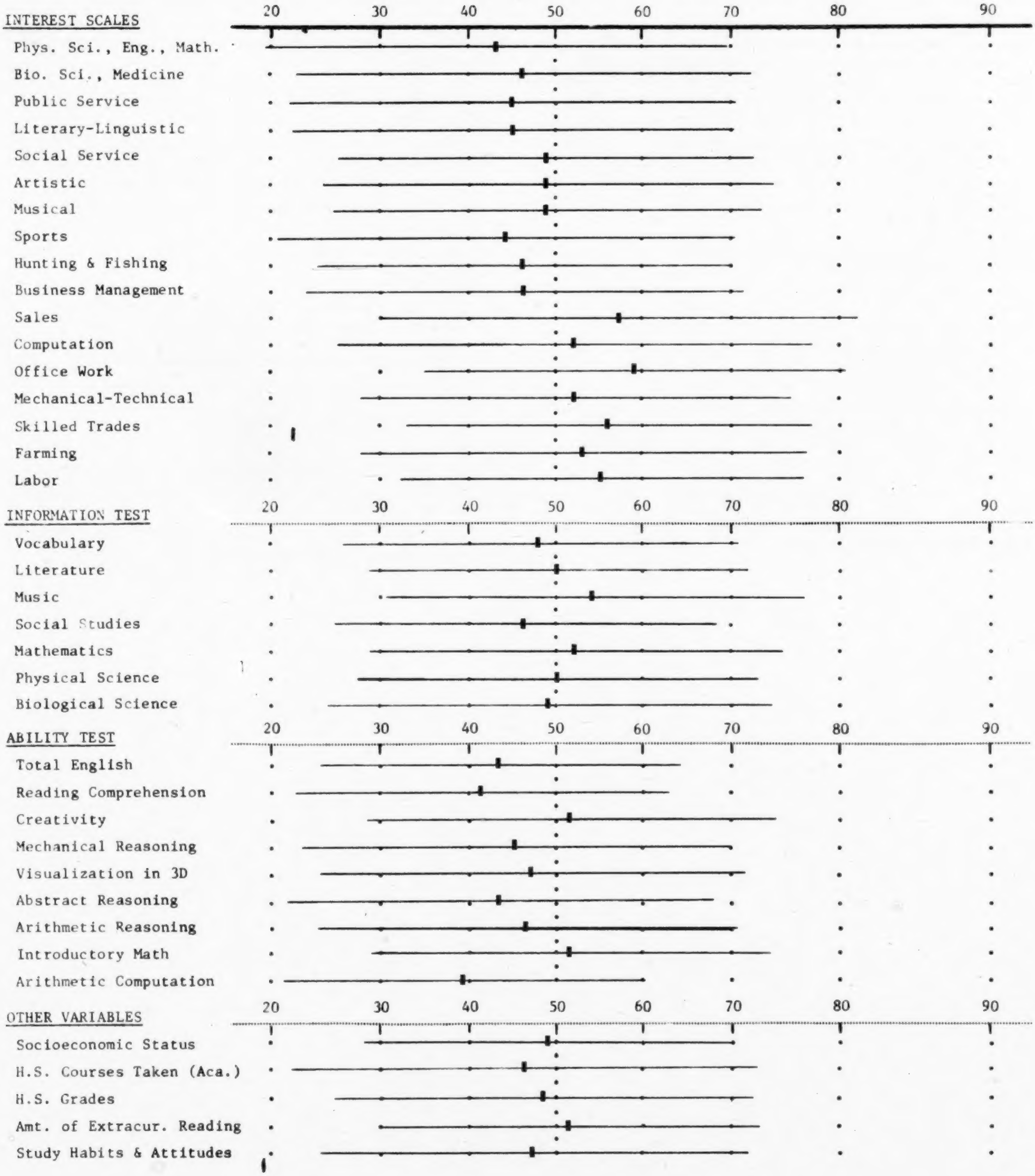
Others

General: High (51st percentile) in extracurricular reading; low (46th percentile) in academic orientation of courses.

Specific: 54th percentile in sociability, social sensitivity, and self-confidence; 46th percentile in self-perception of reading skills.

SUPERVISOR - Business

(Male - n = 200)



CHAPTER 11

CAREER GROUP 9

Mechanics, Industrial Trades

Workers in Career Group 9 are skilled craftsmen. They are responsible for helping to transform the ideas of engineers and scientists into finished products. They use precise tools and instruments to build, operate, and maintain these products. Included in this Career Group are the following jobs:

Clothing, Fashion Trades (Females) (a)
Electrician (not elsewhere classified) (B)
Machinist (C)
Mechanic
  Airplane (D)
  Auto (E)
  Other (not elsewhere classified) (F)
Metal Worker (G)
Printing Trades (H)
Repairman
  Appliance (I)
  Industrial Machine (J)
  Office Machine (K)
  Telephone (L)

Workers in this Career Group usually receive a considerable amount of training. Usually this training consists of supervised work experience as well as classroom instruction.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (65th percentile) in mechanical-technical; lowest (35th percentile) in literary-linguistic.

Similar to: Career Group 10

Information

General: Average around 45th percentile on information scores; highest (49th percentile) in physical science; lowest (40th percentile) in vocabulary.

Specific: 55th percentile in electricity and electronics, and mechanics.

Similar to: Career Group 10

Abilities

General: Around the 44th percentile on ability scores; highest (56th percentile) in mechanical reasoning and three-dimensional visualization; lowest (35th percentile) in arithmetic computation.

Specific: Table reading at 50th percentile.

Similar to: Career Group 10

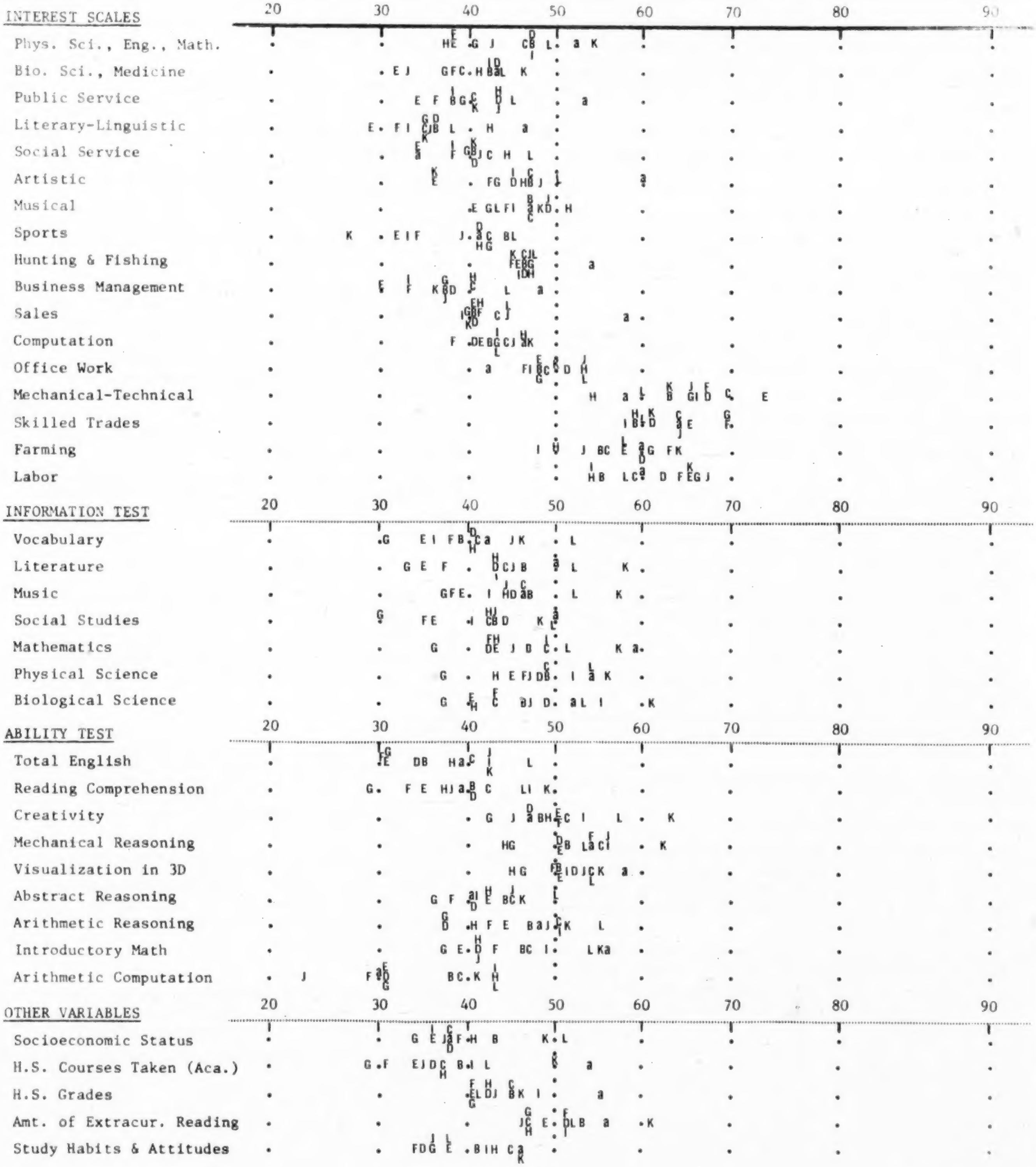
Others

General: High (50th percentile) in extracurricular reading; low (36th percentile) in academic orientation of courses.

Specific: 40th percentile in sociability, and self-perception of reading skills.

CAREER GROUP 9

Mechanics, Industrial Trades



CLOTHING, FASHION TRADES

Importance: Clothing a necessity in temperate zone. Clothing industry important in nation's economic life.

Training: Good eyesight, manual dexterity, and good eye-hand coordination essential in most clothing production jobs.

For most production jobs in clothing industry, on-the-job training of a few weeks to several months. In areas where much clothing produced may be able to get courses in vocational high schools or trade schools.

Fashion designer or apparel designer needs knowledge of fabrics, sense of color, ability to sketch; may learn skill by apprenticeship, working with experienced designers, or by college courses in design. Should also know clothing-making techniques.

Dressmaker and tailor (workers who can make entire garment) may learn trade in vocational training department of public schools, then get additional training on job. Others work up through ranks of ordinary sewers. Tailors may learn by apprenticeship.

Sewing machine operator usually taught informally on the job, though previous sewing experience preferable. Some companies give on-the-job training courses for sewers.

Cutter (who cuts out garments) may learn by apprenticeship, vocational school course, or trade school course, or may work up from other garment-industry jobs.

Fashion models may attend modeling school, take charm courses. Or may be clerical workers used occasionally as models by employers. Some employers demand high school diploma or college training. Physical and personality requirements rigid.

Work Activities: Fashion designer creates new types and styles of clothing. Usually specializes in one kind of garment. Sketches garment planned, specifies fabric, trim, gets management's approval, may make sample. Must produce a certain number of successful designs each season.

Dressmaker and tailer make complete garments and sample garments.

Milliner makes and trims hats.

Furrier makes fur garments and trimmings. Fur cutter chooses, matches, and arranges skins; fur machine operator stitches them together, fur nailer stretches them and trims them to fit pattern, fur finisher puts in lining, binds edges, etc.

Sewing machine operator usually sews a particular seam in the garment, then passes it on to others to do other seams. On high priced garments may sew all seams. Hand sewers use needle and thread; often specialize in one operation.

Cutters use machine to cut out garment parts from many pieces of goods, according to pattern indicated by marker.

Leather worker makes leather garments, belts, buttons, etc.

Fashion model demonstrates garments either in showroom or for photographer.

Outcomes: Increased sale of attractive, economical, or comfortable garments.

Supervision; Social Relations: Usually supervised by foreman, forelady, other superior. Designers relatively free of supervision but designs must sell.

Salary; Other Benefits: In 1970, production workers in garment industry averaged $2.39 an hour. Varies by job and locality. In three large cities, sewing machine operators averaged $2.97 hour; male lining cutters $3.85. Beginning fashion models working for retail stores paid $65-$100 week; experienced ones $110-$125. For fashion shows, hourly rates $15-$60, but most models can work only part time. Working life of female models usually not more than 8 years; of male models may be 20 or more.

Role of Sexes: Four-fifths of garment workers women. Most sewing machine operators women. Most cutters, markers, and pressers men. Four-fifths of fashion models women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (61st percentile) in artistic, sales, mechanical-technical, skilled trades, farming, and labor; lowest (34th percentile) in social service.

Information

General: Average around 50th percentile on information scores; highest (59th percentile) in mathematics; lowest (42nd percentile) in vocabulary.

Specific: 46th percentile in art.

Abilities

General: Around the 47th percentile on ability scores; highest (56th percentile) in mechanical reasoning, three-dimensional visualization, and introductory math; lowest (30th percentile) in arithmetic computation.

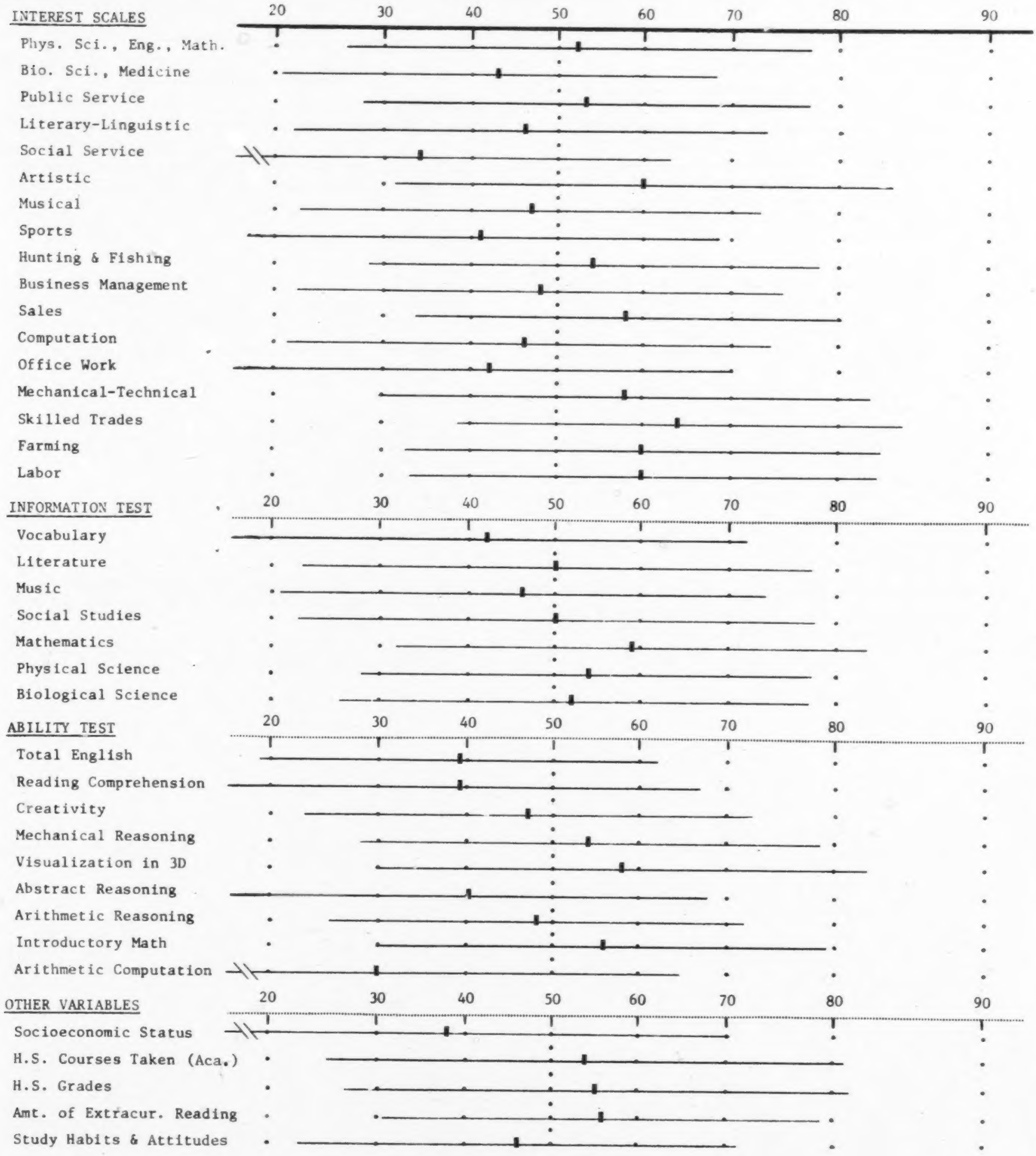
Others

General: High (56th percentile) in high school grades, and amount of extracurricular reading; low (38th percentile) in socioeconomic status.

Specific: 47th percentile in sociability, and social sensitivity.

CLOTHING, FASHION TRADES

(Female - n = 158)



ELECTRICIAN (not elsewhere classified)

Importance: Electrical and electronic equipment fundamental to our economic system.

Training: Two kinds of electricians--construction and maintenance (electrical repairmen). For both, 4-year apprenticeship program combining practical and classroom training recommended, but many learn skills informally as helpers, shifting to jobs giving experience in different skills. High school education with courses in math and science desirable. Electrician must keep up with changes and developments in electrical and electronic devices.

Work Activities: Construction electrician plans, installs, and tests electrical wiring and apparatus used in new buildings. Installs and connects electrical and electronic equipment. Reads and follows blueprints, installs circuits, outlets, fuses and circuit breakers, prevents overloading. Understands and follows electrical codes. Most work for electrical contractors, many self-employed. Some work for government agencies, public utilities, etc. Maintenance electrician does similar work on already existing construction, with emphasis on repair. Maintains and repairs existing equipment, installs new. Does much preventive maintenance. Advises on shutdowns. Uses testing devices. May work in factories, large office buildings, communications industry, etc.

Outcomes: Safe and properly functioning electrical systems and equipment.

Supervision; Social Relations: May work under foreman.

Salary; Other Benefits: In 1970 union minimum hourly wage for construction electrician in large cities averaged about $6.82/hour. Maintenance electricians usually about $3.60 to $4.75/hour.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (61st percentile) in mechanical-technical, and skilled trades; lowest (37th percentile) in public service, literary-linguistic, social service, and business management.

Similar to: Machinist

Information

General: Average around 46th percentile on information scores; highest (49th percentile) in physical science; lowest (39th percentile) in vocabulary.

Specific: Highest (61st percentile) in electricity and electronics.

Abilities

General: Around the 46th percentile on ability scores; highest (51st percentile) in mechanical reasoning, and three-dimensional visualization; lowest (35th percentile) in English.

Specific: Table reading at 61st percentile.

Similar to: Machinist

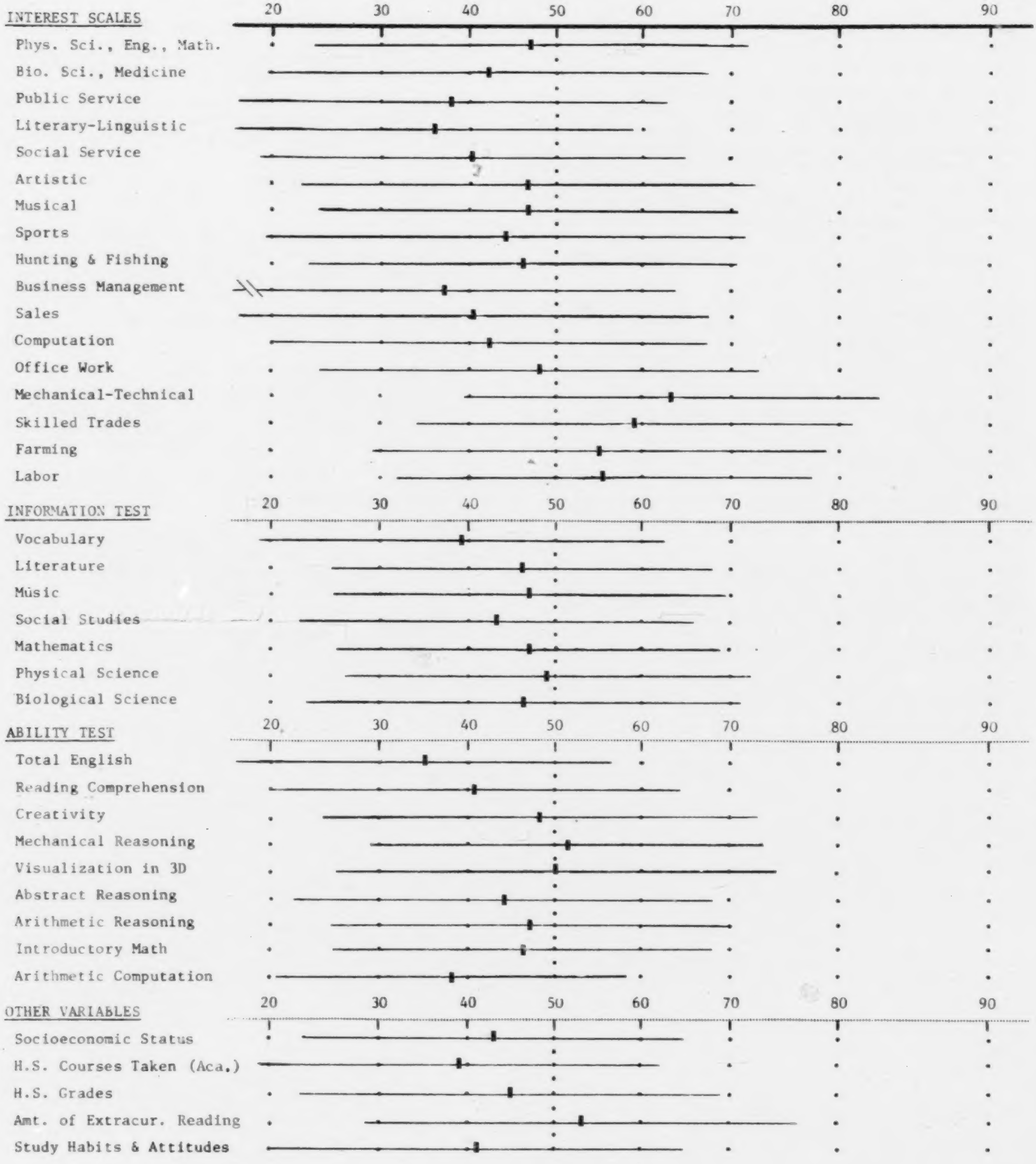
Others

General: High (53rd percentile) in extracurricular reading; low (39th percentile) in academic orientation of courses.

Specific: 39th percentile in self-perception of reading skills; 45th percentile in sociability.

ELECTRICIAN (not elsewhere classified)

(Male - n = 612)



MACHINIST

Importance: Machinists required in maintenance of all types of machinery; needed in factories to keep mechanical equipment operating.

Training: Four-year apprenticeship combining shop training and practical instruction recommended, but many learn informally on the job. Some companies have training programs for machinists. High-school or vocational school education with math, science, and shop training desirable. Additional training beyond that of ordinary machinist needed to operate and service numerically controlled machine tools or machine-and-control systems or to become tool and die makers or instrument makers. Machinists' work requires high accuracy and concentration.

Work Activities: Makes metal parts by use of machine tools out of blocks of metal. Must meet specifications for accuracy. Selects tools and materials, measures dimensions, cuts and finishes tool. Uses precision measuring instruments. According to job may either make or repair parts, or both. Works mainly in factories making machinery, transportation equipment, metal products.

Outcomes: Properly made metal parts for machines, instruments, etc.

Supervision; Social Relations: May be supervised by foreman of section. Some machinists open own shops and are self-employed.

Salary; Other Benefits: In 1969-70 all-round machinists averaged about $2.89 to $4.86 per hour. Largely unionized. Generally get paid holidays, vacations, often get health insurance and pensions.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (66th percentile) in mechanical-technical, and skilled trades; high (56th percentile) in farming, and labor; lowest (35th percentile) in literary-linguistic.

Similar to: Electrician

Information

General: Average around 44th percentile on information scores; highest (49th percentile) in mathematics, and physical science; lowest (42nd percentile) in vocabulary, social studies, and biological science.

Specific: 55th percentile in mechanics.

Abilities

General: Around the 47th percentile on ability scores; highest (55th percentile) in mechanical reasoning, and three-dimensional visualization; lowest (40th percentile) in English, reading comprehension, and arithmetic computation.

Specific: Table reading at 61st percentile.

Similar to: Electrician

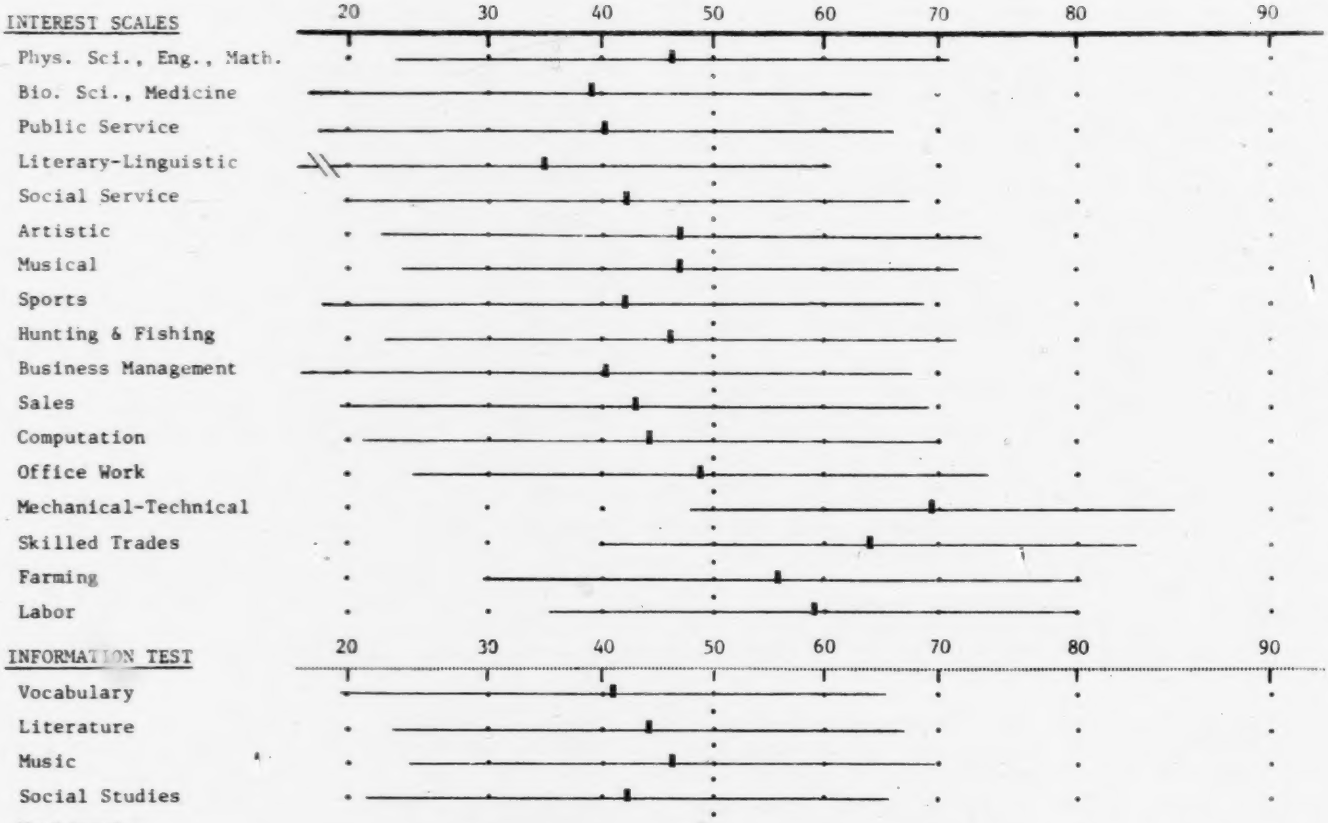
Others

General: High (47th percentile) in extracurricular reading; low (37th percentile) in academic orientation of high school courses.

Specific: 44th percentile in sociability, and self-perception of reading skills.

MACHINIST

(Male - n = 680)



MECHANIC - Airplane

Importance: Mechanic's work essential for plane's operation and for safety of plane, crew, and passengers.

Training: Airlines prefer high school or trade school graduates. To work as airplane mechanic doing repair or maintenance, must be licensed by Federal Aviation Agency in the branch of aircraft repair in which he is to work (airframe, powerplant, etc.). Certification requires written and practical examination and at least 18 months' experience. Many acquire initial training and experience in armed forces. May also attend federally approved mechanics schools, most of which offer 18-24 month program; or 2-year program at college or university. Experience requirement waived for graduates of approved mechanics' schools. Experience in car repair helpful.

Work Activities: Emergency, major and periodic repair and maintenance of airplanes. Location of flaws and defects. Test of repaired planes. May be line-maintenance mechanic or may work in repair shop. Repair shops may be owned by airline or independent. Many mechanics employed by scheduled airlines or independent repair shops. Some by smaller airlines, crop-dusting firms, private owners, aircraft manufacturing plants, armed forces, federal agencies.

Outcomes: Properly functioning planes.

Supervision; Social Relations: Must be able to work as member of a team. Supervised by head mechanic or crew chief.

Salary; Other Benefits: In 1970, mechanics working for scheduled airlines averaged $800-$1,100 a month; others usually less. Occupation highly unionized.

Role of Sexes: With a very few exceptions, this is a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (67th percentile) in mechanical-technical; high (61st percentile) in skilled trades, farming, and labor; lowest (37th percentile) in literary-linguistic, and business management.

Similar to: Mechanic/Auto; Mechanic/Other (not elsewhere classified); Metal Worker

Information

General: Average around 44th percentile on information scores; highest (49th percentile) in physical and biological sciences; lowest (40th percentile) in vocabulary.

Specific: High (60th percentile) in electricity and electronics, and mechanics; 52nd percentile in aerospace, and military.

Abilities

General: Around the 40th percentile on ability scores; highest (51st percentile) in mechanical reasoning, and three-dimensional visualization; lowest (33rd percentile) in English, and arithmetic computation.

Specific: Table reading at 58th percentile.

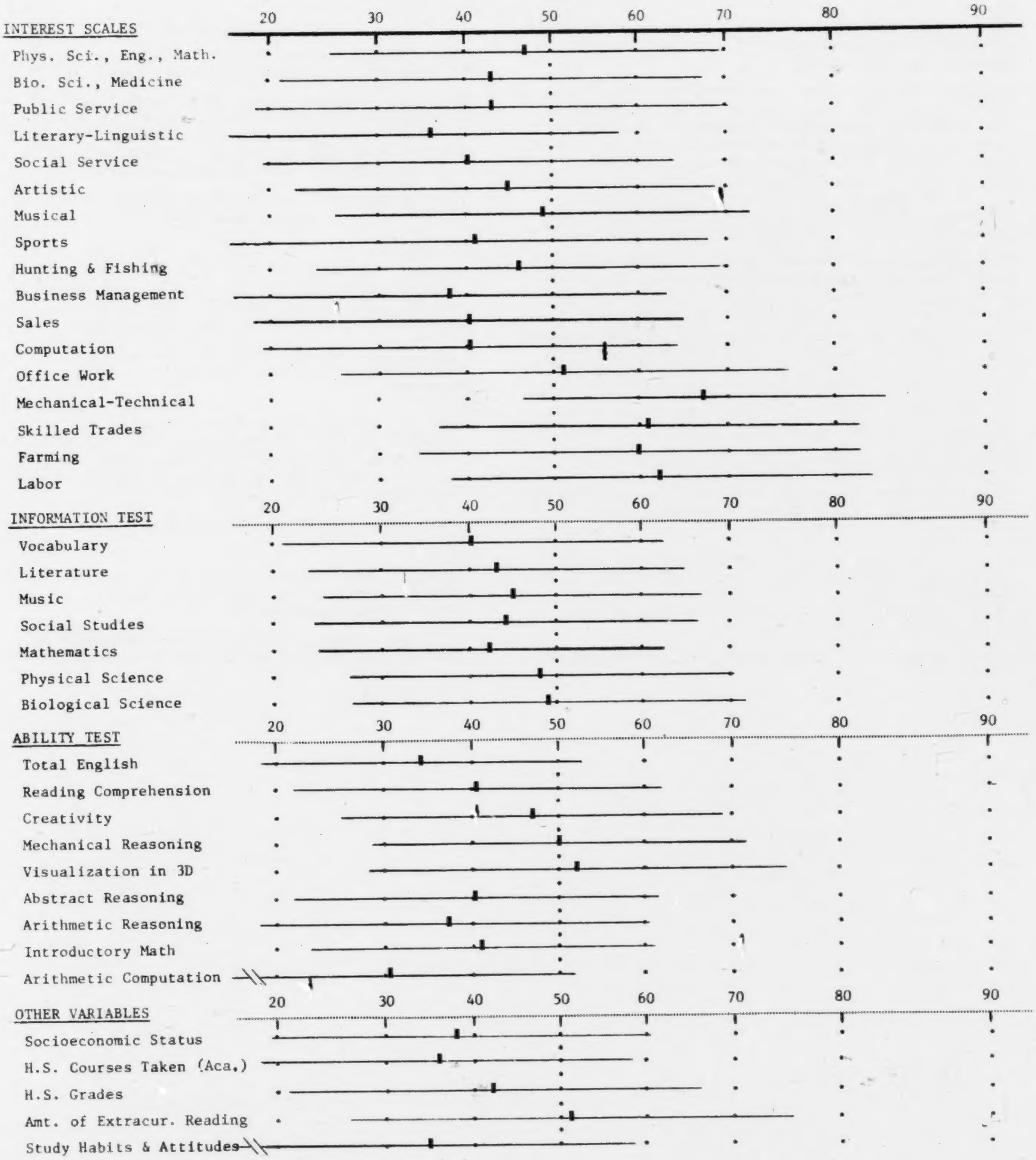
Others

General: High (51st percentile) in extracurricular reading; low (35th percentile) in study habits and attitudes.

Specific: 41st percentile in sociability, and self-perception of reading skills.

MECHANIC - Airplane

(Male - n = 258)



MECHANIC - Auto

Importance: Automobile America's major means of transportation; mechanic necessary for car's continued satisfactory functioning.

Training: Three or four year formal apprenticeship, combining practical and class work, recommended, but most mechanics learn skills on the job. Start as helpers, gasoline pump attendants, etc. Three or four years required to become good mechanic, additional year or two to become a specialist. Can get training in armed forces, vocational schools, trade schools, government courses for unemployed. High-school education desirable, as are math and science courses.

Work Activities: Performs preventive maintenance such as lubrication, replacement of worn parts, and adjustment; diagnoses causes of trouble, makes repairs and replaces parts. Uses tools and testing equipment. Most mechanics do general work but some become specialists in rear-end mechanics, air conditioning, transmission, etc. Most work for car dealers, repair shops, gasoline service stations; some for taxi companies, car manufacturers, etc.

Outcomes: Properly functioning cars.

Supervision; Social Relations: In shop employing several mechanics, may be supervised by repair shop foreman or service manager. Many auto mechanics self-employed. Good relations with other mechanics and with customers desirable.

Salary; Other Benefits: In late 1969 skilled mechanics averaged $5.16 per hour; inexperienced helpers or trainees one-half or one-third as much. Some work partly on commission. Many employers provide vacations, insurance, retirement.

Role of Sexes: With a few exceptions, overwhelmingly a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (65th percentile and above) in mechanical-technical, skilled trades, and labor; high (58th percentile) in farming; lowest (31st percentile) in biological science and medicine, literary-linguistic, sports, and business management.

Similar to: Mechanic/Airplane; Mechanic/Other (not elsewhere classified); Metal Worker

Information

General: Average around 39th percentile on information scores; highest (44th percentile) in mathematics, and physical science; lowest (35th percentile) in vocabulary, and literature.

Specific: Comparatively high (62nd percentile) in electricity and electronics, and mechanics.

Abilities

General: Around the 42nd percentile on ability scores; highest (50th percentile) in creativity, mechanical reasoning, and three-dimensional visualization; lowest (31st percentile) in English, and arithmetic computation.

Specific: 47th percentile in table reading.

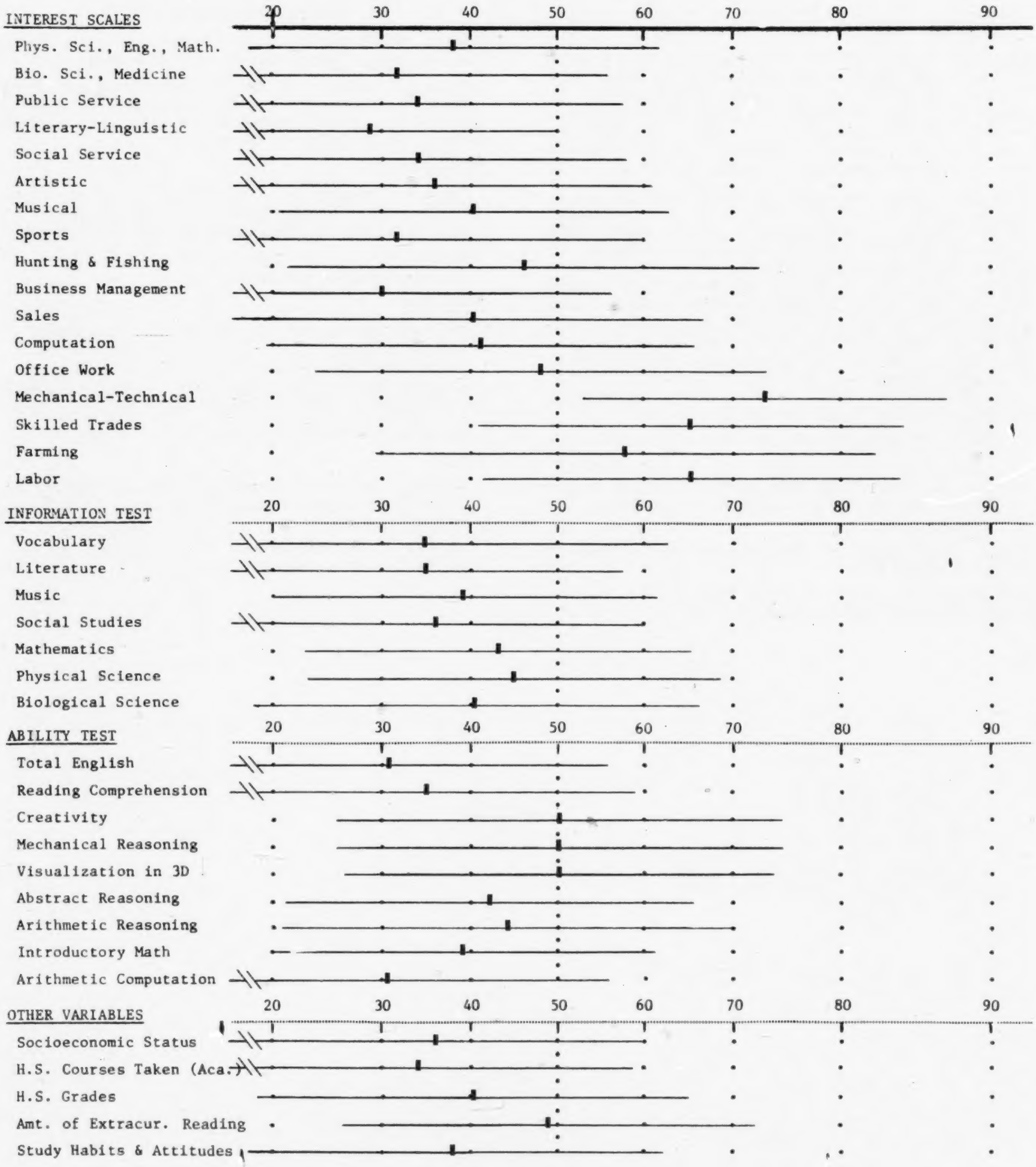
Others

General: High (49th percentile) in extracurricular reading; low (34th percentile) in academic orientation of high school courses.

Specific: 32nd percentile in self-perception of reading skills; 40th percentile in sociability.

MECHANIC - Auto

(Male - n = 270)



MECHANIC - Other (not elsewhere classified)

Importance: Ours a machine-based civilization that requires mechanics to keep it functioning.

Training: Apprenticeship training, with 3 to 4 years of on-the-job training plus classwork, recommended, though many qualify through trade schools, armed forces training, on-the-job training, manufacturers' schools, correspondence schools, junior colleges. Time required varies with specialty. High school education, including math and science, desirable.

Work Activities: Installs, maintains, and repairs various types of machine. May assist in manufacturing. May be aircraft, missile, and spacecraft manufacturing mechanic, aircraft mechanic, automobile mechanic, bowling-pin-machine mechanic, bus mechanic, Diesel mechanic, optician or optical mechanic, farm equipment mechanic, gas burner mechanic, heating mechanic, motorcycle mechanic, oil burner mechanic, refrigeration mechanic, truck mechanic, vending machine mechanic, etc. Main areas are automotive mechanics, appliance servicemen, industrial machinery repairmen, and business machine servicemen. Nearly 30% work in manufacturing, about 20% in retail trade.

Outcomes: Properly functioning device or machine.

Supervision; Social Relations: May be supervised by foreman, maintenance manager, service manager, etc. May be self-employed. Good relations with client important.

Salary; Other Benefits: Dependent on kind of work and place of employment.

Role of Sexes: Largely a man's field, though some women at work in manufacturing.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (63rd percentile and above) in mechanical-technical, skilled trades, farming, and labor; lowest (33rd percentile) in literary-linguistic, sports, and business management.

Information

General: Average around 38th percentile on information scores; highest (46th percentile) in physical science; lowest (35th percentile) in social studies.

Specific: High (59th percentile) in electricity and electronics, mechanics.

Abilities

General: Around the 42nd percentile on ability scores; highest (52nd percentile) in creativity, mechanical reasoning, and three-dimensional visualization; lowest (31st percentile) in English, reading comprehension, and arithmetic computation.

Specific: Table reading at 54th percentile.

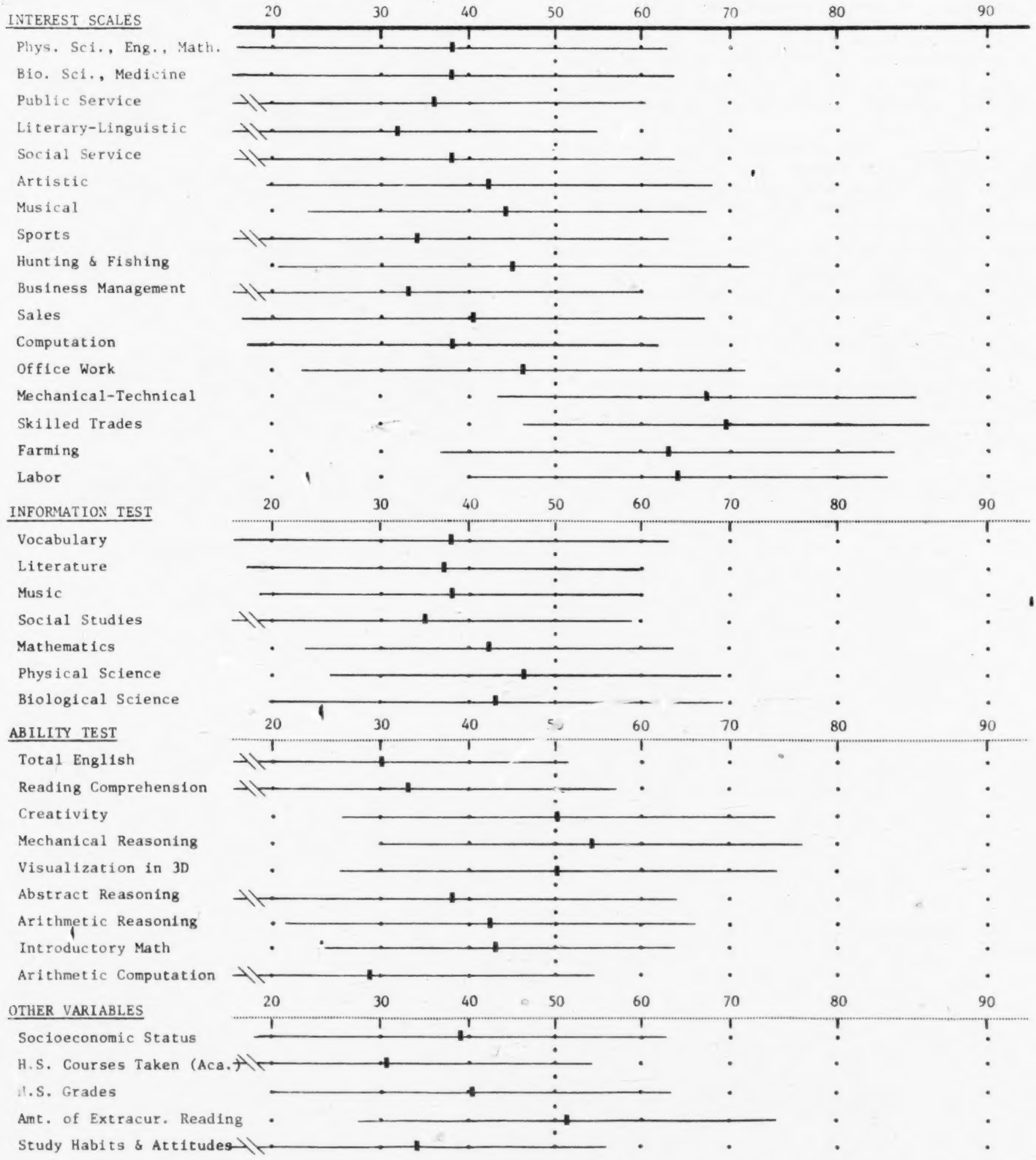
Others

General: High (51st percentile) in extracurricular reading; low (31st percentile) in academic orientation of courses.

Specific: 39th percentile in sociability, and self-perception of reading skills.

MECHANIC - Other (not elsewhere classified)

(Male - n = 382)



METAL WORKER

Importance: Our manufacturing economy is based on machines, which are made of metal. Metal workers needed to manufacture them and provide parts for them. Metal also necessary for communications and transport.

Training: Metal worker may acquire skill by apprenticeship, by on-the-job training, or informally when acting as a helper.

Work Activities: A great variety of jobs are included under the term metal worker. They include pouring molten metal, pulling metal into wire, electroplating, welding, metal finishing, metal patternmaking, and many others.

Work activities vary from very simple to highly skilled.

Outcomes: Suitably prepared metals, metal products, parts, or materials and devices needed for their production.

Supervision; Social Relations: Usually under a foreman or other superior.

Salary; Other Benefits: Wide variation of salary according to duties, degree of unionization, etc. In 1970 production workers in iron and steel foundries averaged $3.49 an hour. Often excellent fringe benefits.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (61st percentile and higher) in mechanical-technical, skilled trades, farming, and labor; lowest (36th percentile) in biological science and medicine, literary-linguistic, and business management.

Similar to: Mechanic/Airplane; Mechanic/Auto; Mechanic/Other (not elsewhere classified).

Information

General: Average around 36th percentile on information scores; highest (37th percentile) in music, and physical and biological sciences; lowest (30th percentile) in social studies.

Abilities

General: Around the 37th percentile on ability scores; highest (44th percentile) in creativity, mechanical reasoning, and three-dimensional visualization; lowest (30th percentile) in English, reading comprehension, and arithmetic computation.

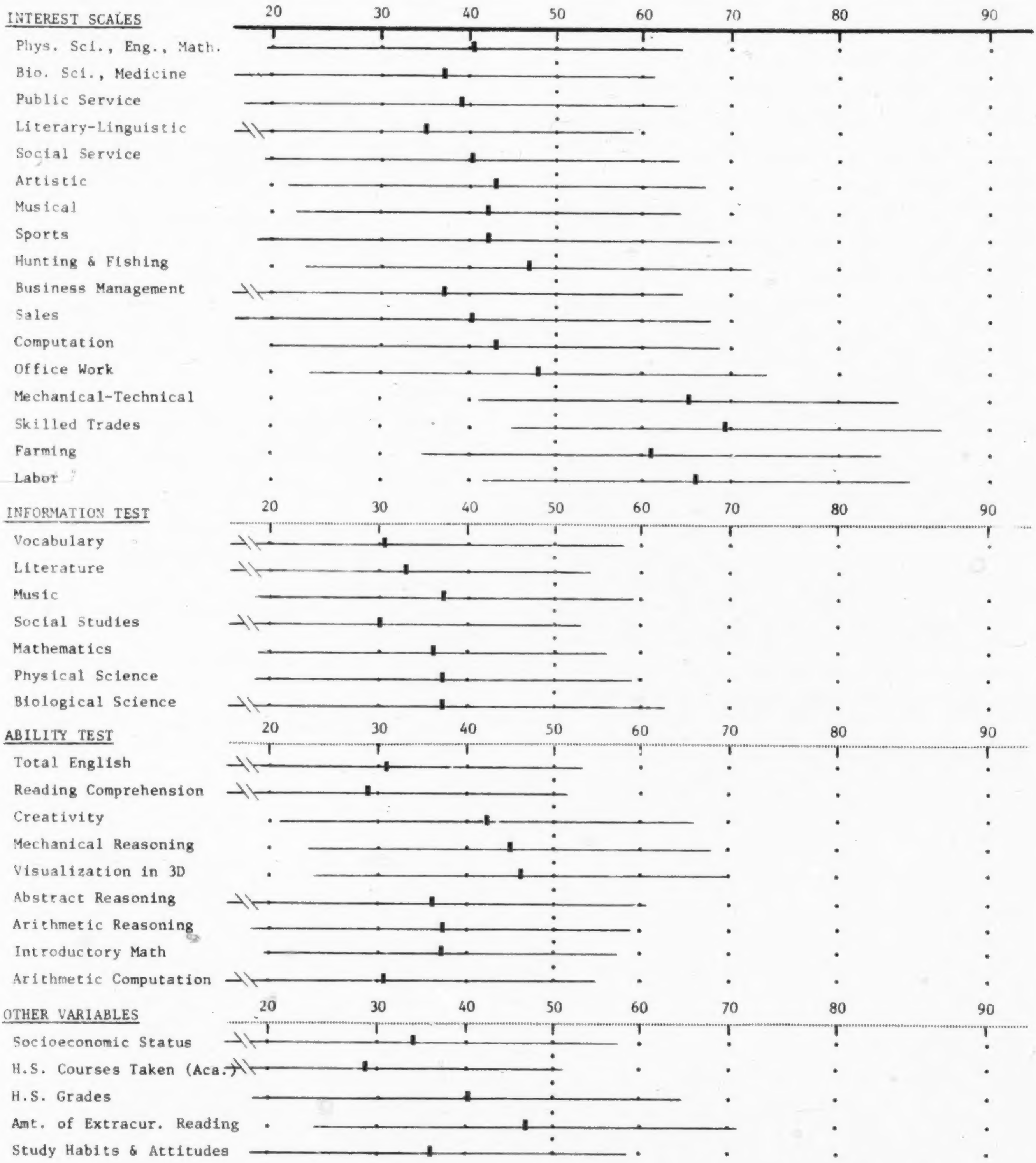
Others

General: High (47th percentile) in extracurricular reading; low (29th percentile) in academic orientation of courses.

Specific: 46th percentile in sociability.

METAL WORKER

(Male - n = 325)



PRINTING TRADES

Importance: A free press is one of the foundations of democracy. Ready availability of printed matter makes possible a high level of popular education. Printing a major means of communication.

Training: Apprenticeship a common method of training. May also learn as helper or through combination of work experience and schooling. Apprenticeship requires 4-6 years; includes classroom work or correspondence study in addition to on-the-job training.

Usually must be 18-30 years of age and pass physical examination; often aptitude tests. Should have high school education or equivalent; be good at spelling, punctuation, grammar, basic mathematics. Science for use in printing processes also important. Many schools give courses in printing.

Work Activities: Printing includes the printing of both type and pictures, in the form of books and magazines, business forms, gift and candy bar wrappings, engravings, etc. The largest number of printing tradesmen work in newspaper publishing; the next largest number in commercial or job printing. Printing tradesmen usually specialize in some one particular kind of printing.

Hand compositors set type by hand; typesetting machine operators set it by machine, as do linotype operators. Monotype keyboard operators, monotype casting operators and phototypesetting machine operators produce materials later fed into machines to set up type. Photoengravers produce plates for pictures and other non-type material. Electrotypers and stereotypers make duplicate press plates. Printing pressmen prepare forms and plates for final printing and operate the presses. Lithographers prepare material for offset printing. Bookbinders bind books, periodicals, etc. after they have been printed.

Outcomes: Properly reproduced printed text or pictures.

Supervision; Social Relationships: Supervision by superior. Printing trades strongly unionized.

Salary; Other Benefits: In 1970, in the newspaper business, hand compositors averaged $5 00 an hour, machine operators $5.09, photoengravers $5.56, pressmen $4.94, stereotypers $4.97, and mailers $4.61. Rates in book and job printing were roughly similar. Lithographers in 69 large cities earned $3.71 to $6.46 an hour.

Bookbinders average $4.89 an hour, but bindery women only $2.15 to $3.41 an hour.

Role of Sexes: In the skilled occupations of the printing trades, workers are nearly all men. Many less skilled jobs such as bindery work held by women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (54th percentile and above) in office work, mechanical-technical, skilled trades, and labor; lowest (39th percentile) in physical science, engineering and mathematics, business management, and sales.

Information

General: Average around 43rd percentile on information scores; highest (44th percentile) in music; lowest (40th percentile) in vocabulary, and biological science.

Abilities

General: Around the 42nd percentile on ability scores; highest (49th percentile) in creativity; lowest (38th percentile) in English, and reading comprehension.

Specific: 47th percentile in memory for words.

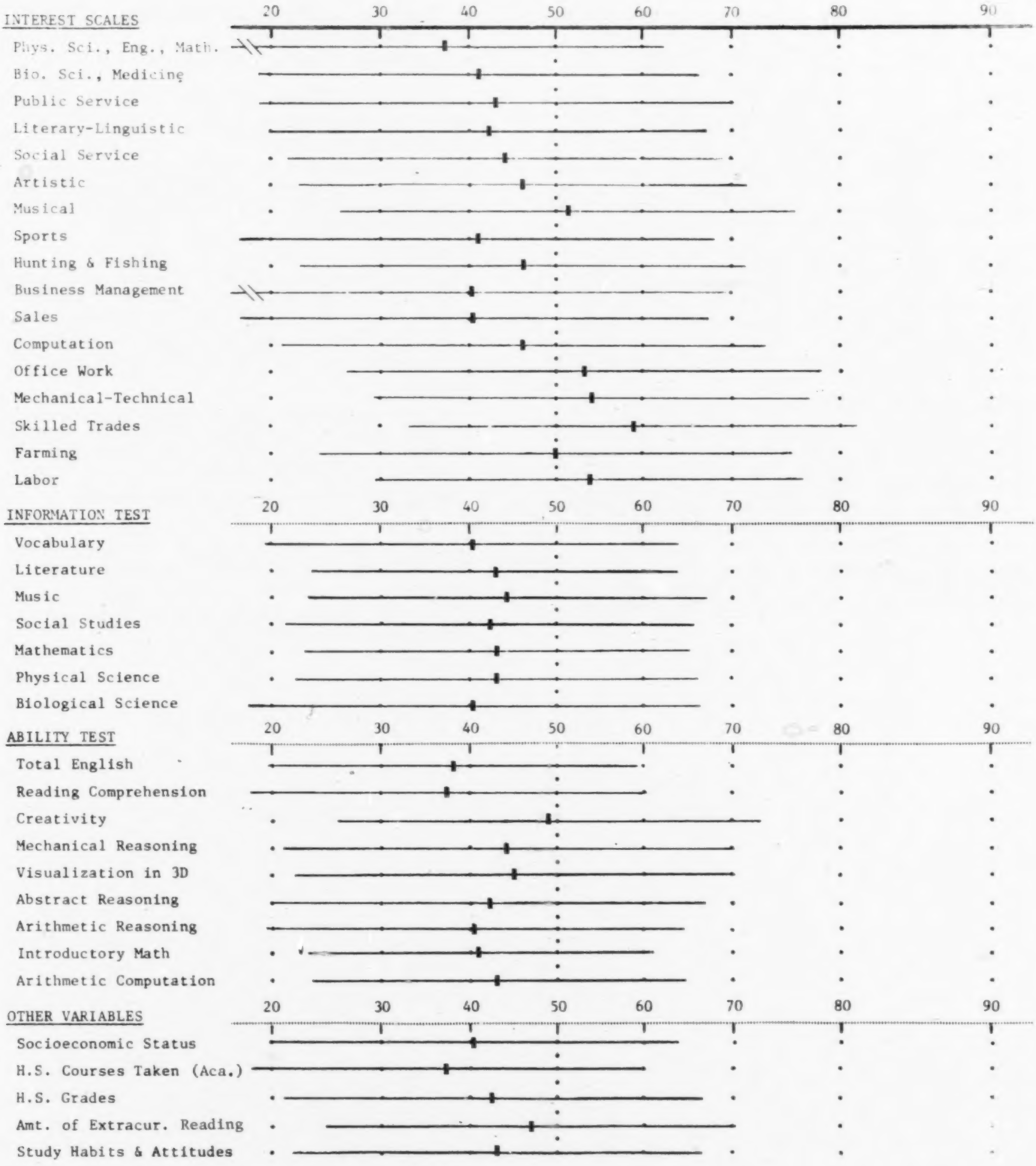
Others

General: High (47th percentile) in extracurricular reading; low (37th percentile) in academic orientation of courses.

Specific: 45th percentile in sociability; 37th percentile in self-perception of reading skills.

PRINTING TRADES

(Male - n = 291)



REPAIRMAN - Appliance

Importance: One of the three largest groups of mechanics and repairmen. Number of appliances per home greatly increased in recent years; some appliances such as refrigerators regarded as necessities.

Training: Usually acquire skills through on-the-job training; up to 3 years to become fully qualified. May begin by installing new appliances, rebuilding parts, replacing switches, etc. Can also take correspondence courses, attend technical schools, manufacturers' schools. Practical knowledge of electricity, wiring, and electronics necessary. Must keep up with field by reading handbooks, repair manuals, etc.

Work Activities: Installs new appliances, diagnoses trouble in malfunctioning appliances, replaces or repairs faulty parts, makes necessary adjustments. Usually specializes in either gas or electrical appliances, and in repair of a single type of appliance such as automatic washer. Uses scientific instruments as testing devices. Gives estimates of probable costs to customers; keeps records.

Outcomes: Properly functioning appliances.

Supervision; Social Relations: Closely supervised for first 6-12 months. Later most appliance servicemen work in independent repair shops or retail service centers, hence are relatively free of supervision. Some work in service centers run by appliance manufacturers and distributors, public-utility companies, etc. Good relations with customers essential.

Salary; Other Benefits: In 1970 most experienced servicemen earned over $3 hour, some up to $5.30. Trainees start at $2-$3 hour. Wide variations in pay. Most get paid vacations, sick leave, retirement, etc. unless self-employed.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (58th percentile and above) in mechanical-technical, and skilled trades; lowest (33rd percentile) in literary-linguistic, sports, and business management.

Information

General: Average around 43rd percentile on information scores; highest (54th percentile) in natural sciences; lowest (36th percentile) in vocabulary.

Specific: Highest (69th percentile) in electricity and electronics; high (61st percentile) in mechanics.

Abilities

General: Around the 49th percentile in ability scores; highest (55th percentile) in creativity, and mechanical reasoning; lowest (41st percentile) in English, and abstract reasoning.

Specific: 43rd percentile in table reading.

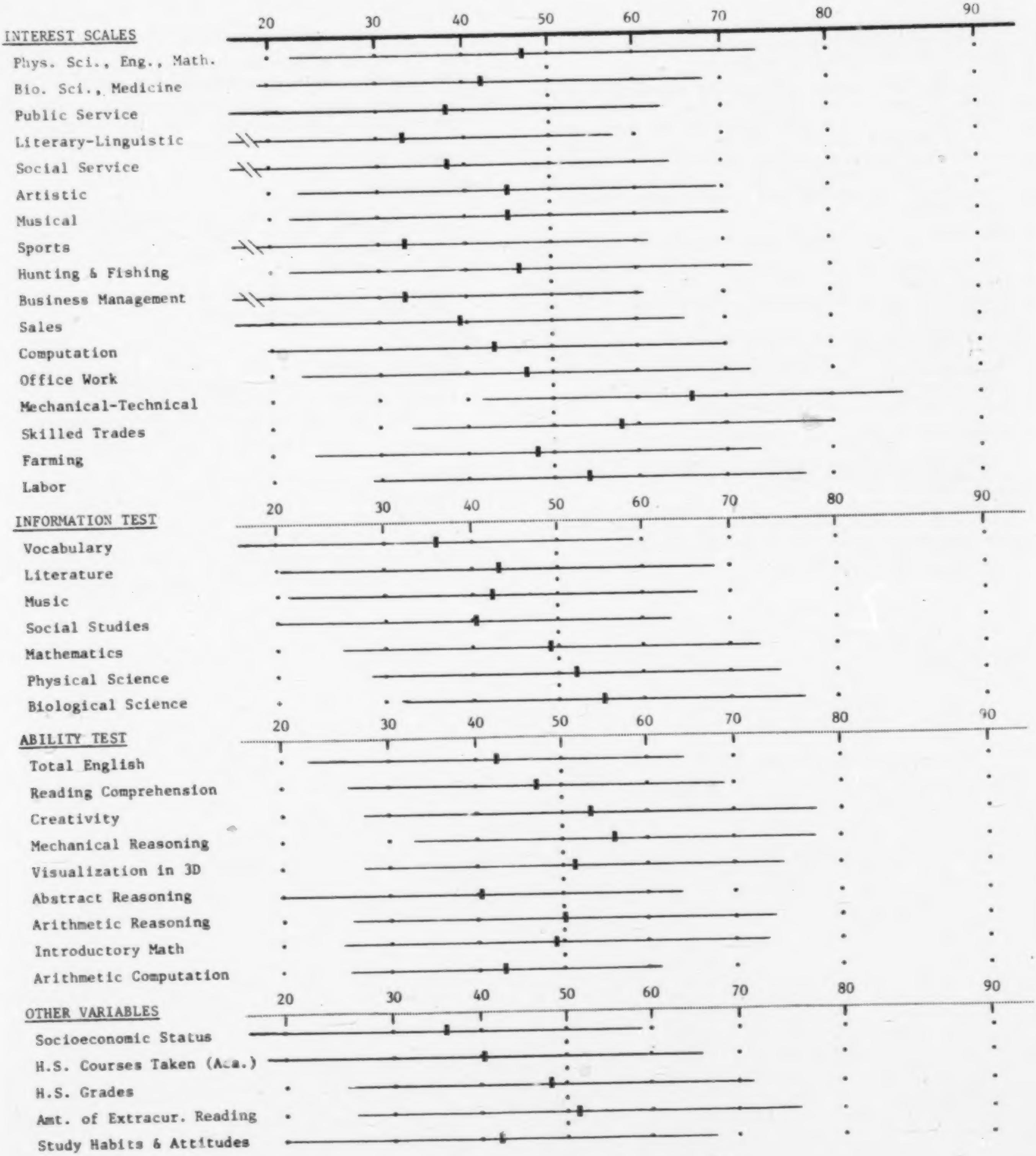
Others

General: High (51st percentile) in extracurricular reading; low (36th percentile) in socioeconomic status.

Specific: 42nd percentile in sociability, and self-perception of reading skills.

REPAIRMAN - Appliance

(Male - n = 153)



REPAIRMAN - Industrial Machine

Importance: Machinery quickly breaks down unless it is kept repaired. Our economy is dependent on the continued functioning of machinery.

Training: Some learn through paid apprenticeship programs (4 years) which combine classroom or correspondence work with on-the-job training, but most learn through working informally as helpers. Must learn shop mechanics, blueprint reading, hydraulics, welding, and how to operate, lubricate, and adjust machinery. In high school should take mechanical drawing, math, blueprint reading.

Need mechanical aptitude and good physical condition.

Work Activities: Repairs damaged machinery, replaces parts, performs lubrication and preventive maintenance. Determines cause of breakdowns; accomplishes repairs quickly so that production will not be held up. Work often requires ability to understand blueprints, lubrication charts, and engineering specifications. When replacement parts are not available may have to sketch part to be made in machine shop, or may weld broken parts. May keep maintenance records.

Outcomes: Properly functioning industrial machinery.

Supervision; Social Relations: Supervised by superior in industrial establishment.

Salary; Other Benefits: In 1969-70 survey of pay in metropolitan areas, most industrial machinery repairmen were found to earn $3.75 an hour or more.

Role of Sexes: A man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (65th percentile) in mechanical-technical, skilled trades, and labor; lowest (34th percentile) in biological science, and literary-linguistic.

Information

General: Average around 45th percentile on information scores; highest (47th percentile) in physical and biological science; lowest (43rd percentile) in social studies.

Specific: High (59th percentile) in electricity and electronics, and mechanics.

Abilities

General: Around the 45th percentile on ability scores; highest (55th percentile) in mechanical reasoning, and three-dimensional visualization; lowest (23rd percentile) in arithmetic computation.

Specific: Table reading at 52nd percentile.

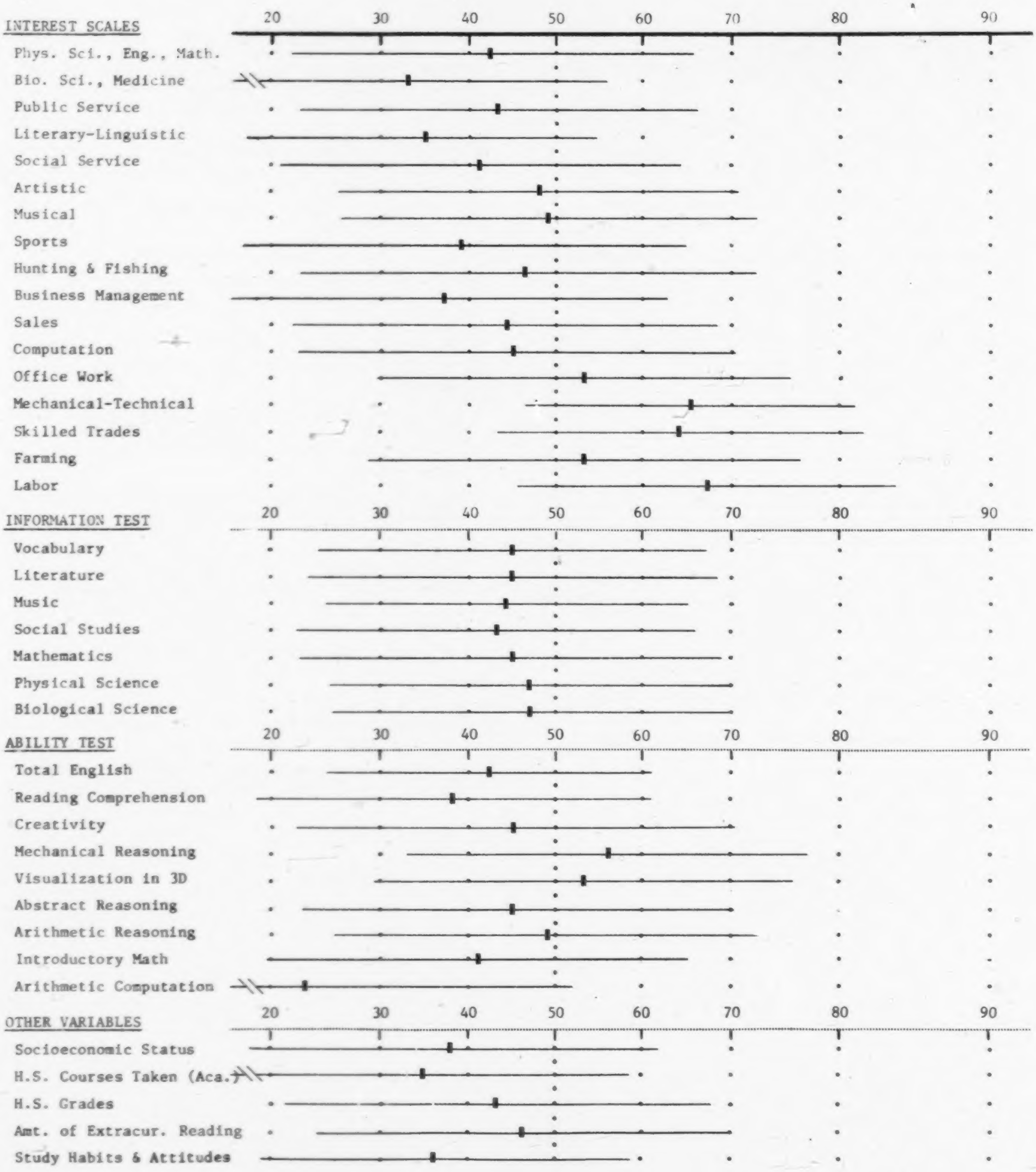
Others

General: High (46th percentile) in extracurricular reading; low (35th percentile) in academic orientation of high school courses.

Specific: 45th percentile in sociability; 33rd percentile in self-perception of reading skills.

REPAIRMAN - Industrial Machine

(Male - n = 65)



REPAIRMAN - Office Machine

Importance: Office machines are becoming increasingly complex as they come to include electrical and electronic components, and an increasing amount of office work is done by machine.

Training: Should have either high-school education or compensating mechanical aptitude or experience. To service electrical or electronic equipment need additional year of training or experience. Often have to pass tests in mechanical aptitude, electricity or electronics, intelligence, color vision, etc. May have to be bonded.

Training generally acquired on the job and in manufacturers' training courses. May take courses at vocational schools, by correspondence, or in government training programs. Often take refresher courses to keep up with new machines. Period of training needed depends on kind and number of machines serviced. Often start by servicing easier machines, work up to others.

For electrical and electronic machines, engineering courses or electronics training in armed forces helpful.

Work Activities: Office machine repairman may specialize in repair of typewriters, calculating machines, cash registers, accounting-bookkeeping machines, data-processing equipment, dictating machines, duplicating and copying machines, or postage and mailing equipment; or he may specialize in the products of a single manufacturer. Usually repairs machines at office where they are used if possible. May also perform regular maintenance (lubrication, etc.) on a service contract. Uses testing instruments. May act as salesman for service contracts or for paper, cards, etc.

Most business machine servicemen work in shops run by business machine manufacturers, some in independent repair shops, some for large organizations or for government.

Outcomes: Properly functioning office machines.

Supervision; Social Relationships: Works under superior in shop or department, especially during on-the-job training. Needs good vocabulary and conversational ability to discuss repair and use of machines at the offices owning them or leasing them.

Salary; Other Benefits: In 1970 experienced servicemen usually earned $110-$300 a week. Higher rates were for those servicing more complicated machines. Trainees started at $80-$105 a week.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (61st percentile and above) in mechanical-technical, skilled trades, farming, and labor; lowest (27th percentile) in sports.

Information

General: Average around 57th percentile on information scores; highest (61st percentile) in biological science; lowest (47th percentile) in vocabulary, and social studies.

Specific: Highest (73rd percentile) in electricity and electronics; 63rd percentile in mechanics.

Abilities

General: Around the 51st percentile on ability scores; highest (63rd percentile) in creativity, and mechanical reasoning; lowest (42nd percentile) in English, and arithmetic computation.

Specific: 50th percentile in memory for words.

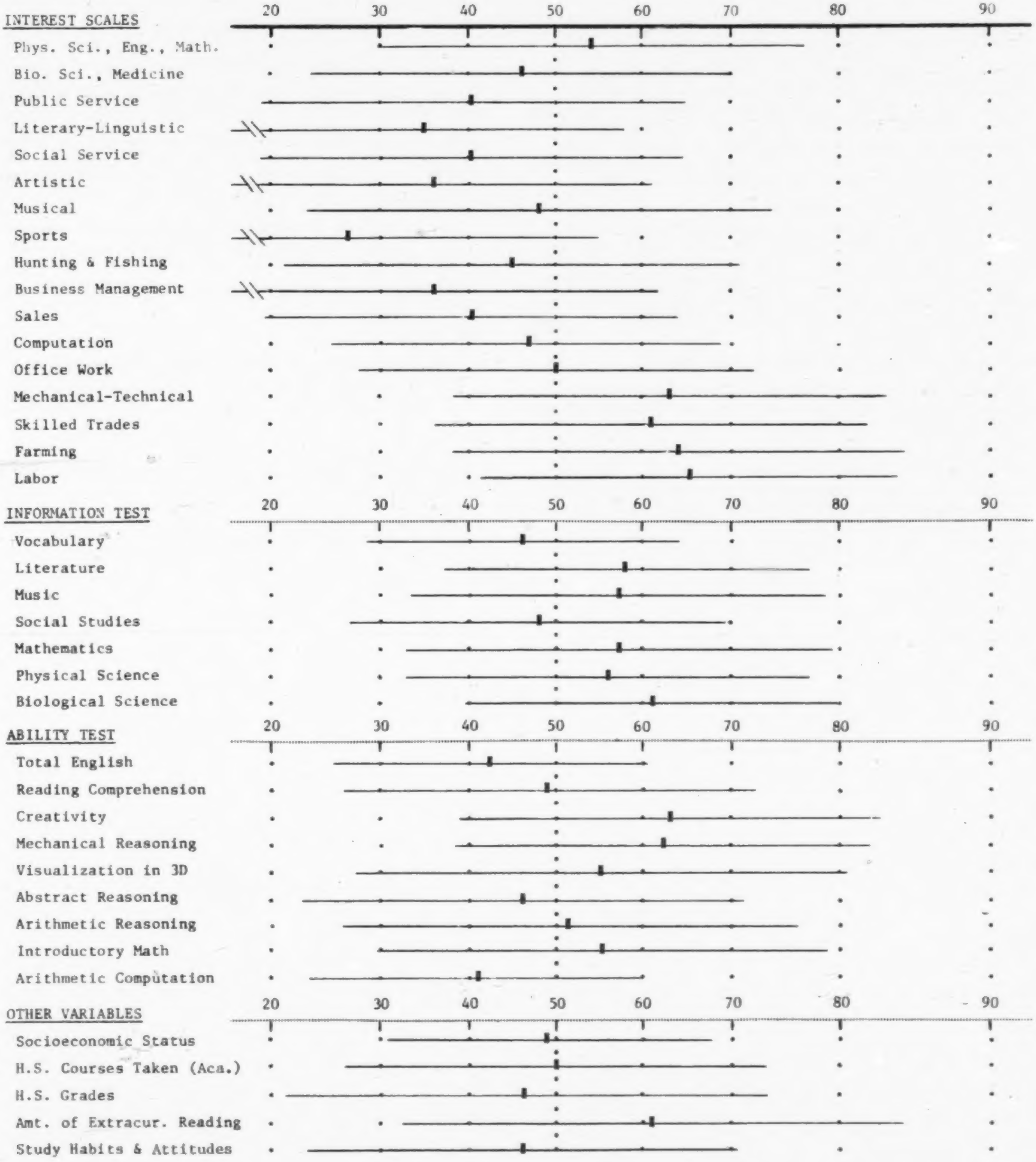
Others

General: High (61st percentile) in extracurricular reading; low (46th percentile) in high school grades, and study habits and attitudes.

Specific: 52nd percentile in sociability; 46th percentile in self-perception of reading skills.

REPAIRMAN - Office Machine

(Male - n = 51)



REPAIRMAN - Telephone (including installers)

Importance: Telephones a necessary method of communication for both businesses and individuals.

Training: Should have high school or vocational school education; usually has to take aptitude tests. Needs good dexterity and eyesight. Company then gives on-the-job training under realistic conditions; new employee then becomes an assistant to an experienced employee. Applicants for telephone repairman training have often acquired previous experience as linemen.

Work Activities: Installs and services telephones at place of use. Replaces telephones, adds extension phones, changes party lines. Connects newly installed phones to outside wires. Same man may do both installation and repair; if so is called telephone installation repairman. May also do PBX installation and repair. Outdoor work and climbing sometimes necessary; may work overtime.

Outcomes: Properly functioning telephones.

Supervision; Social Relations: Closely supervised during training period; thereafter usually works alone. Needs ability to talk to clients.

Salary; Other Benefits: In 1969, average hourly pay for telephone and PBX installers was $3.62. In 1970 in one of higher-salaried cities, telephone installers and repairmen started at $105.50; after 6 years' experience to get $190.

Role of Sexes: Mainly a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (58th percentile and above) in mechanical-technical, skilled trades, farming, and labor; lowest (38th percentile) in literary-linguistic.

Information

General: Average around 52nd percentile on information scores; highest (54th percentile) in physical science; lowest (50th percentile) in social studies.

Specific: High (63rd percentile) in electricity and electronics.

Abilities

General: Around the 53rd percentile on ability scores; highest (57th percentile) in creativity; lowest (43rd percentile) in arithmetic computation.

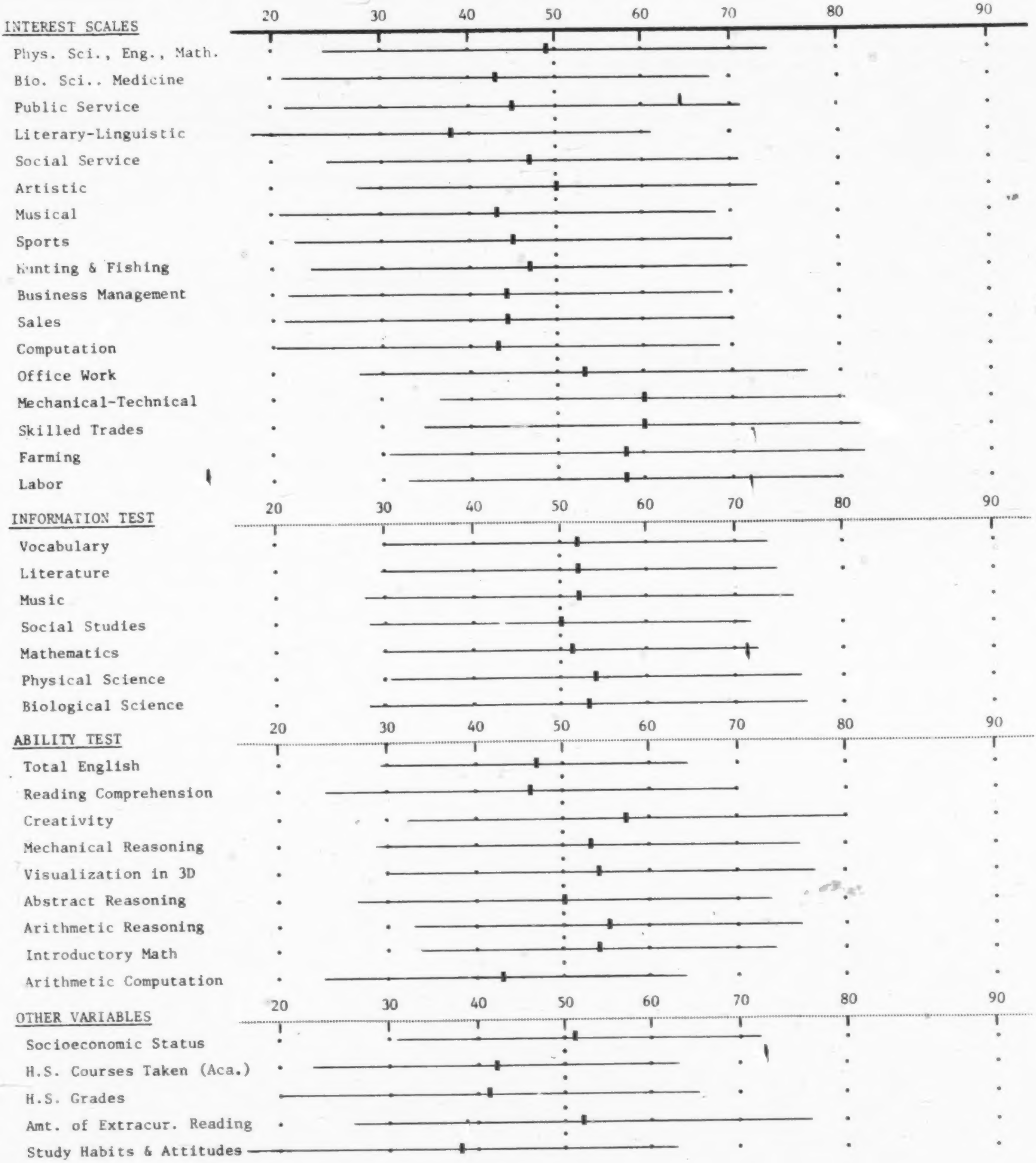
Others

General: High (52nd percentile) in extracurricular reading; low (38th percentile) in study habits and attitudes.

Specific: High (53rd percentile) in self-perception of reading skills; 48th percentile in sociability.

REPAIRMAN - Telephone (including installers)

(Male - n = 149)



CHAPTER 12

CAREER GROUP 10

Construction Trades

Occupations in Career Group 10 all involve building or repairing things. It takes many different kinds of workers to complete a building. Most construction workers work for a contractor who contracts, or agrees, to do a specific job, such as installing a heating system. Some workers are self-employed, however, and work directly for their customers. The following jobs are included in Career Group 10:

Bricklayer, Mason, Painter, Roofer, Plasterer, etc. (A)
Building Construction/Miscellaneous (B)
Carpenter (C)
Foreman (not elsewhere classified) (D)
Heavy Equipment Operator (E)
Mining, Quarrying, etc. (F)
Plumber, Pipefitter (G)

Special training is required to become a worker in Career Group 10. After high school, a formal apprenticeship training is recommended. This involves on-the-job experience combined with some related classroom instruction.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (66th percentile) in skilled trades; lowest (37th percentile) in literary-linguistic.

Similar to: Career Group 9

Information

General: Average around 38th percentile on information scores; highest (42nd percentile) in mathematics, and biological science; lowest (35th percentile) in vocabulary.

Specific: 42nd percentile in outdoor activities.

Similar to: Career Group 9

Abilities

General: Around the 42nd percentile on ability scores; highest (46th percentile) in three-dimensional visualization; lowest (31st percentile) in reading comprehension, and arithmetic computation.

Similar to: Career Group 9

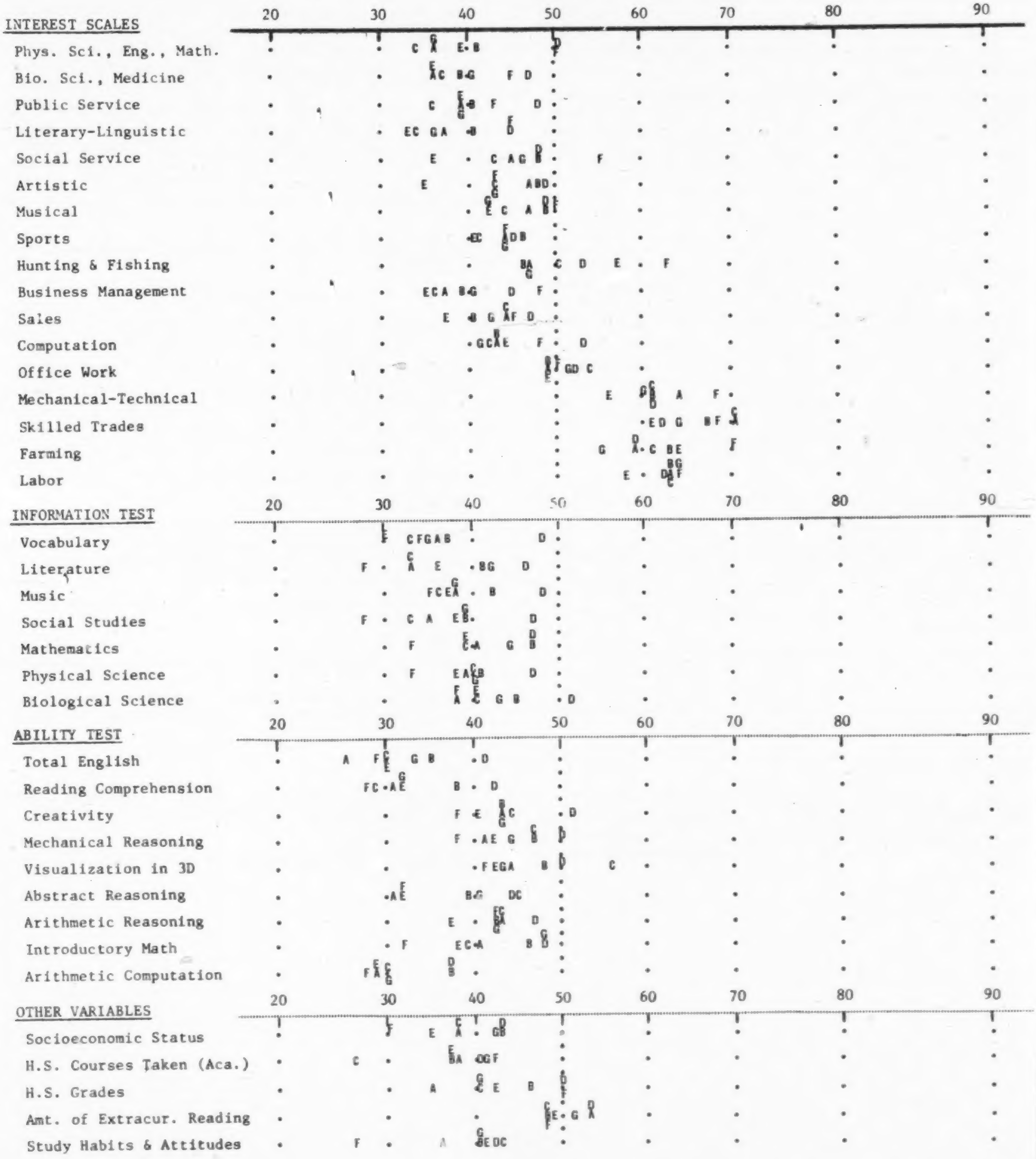
Others

General: High (51st percentile) in extracurricular reading; low (42nd percentile) in socioeconomic status.

Specific: 45th percentile in sociability.

CAREER GROUP 10

Construction Trades



BRICKLAYER, MASON, PAINTER, ROOFER, PLASTERER, etc.

Importance: Brick and concrete among major construction materials, important in construction of large buildings, highways, bridges, factories, etc., as well as homes. Roofers required for all buildings, painters and plasterers for most.

Training: For all these, 3-year apprenticeship recommended (for plasterers 3 or 4 years). Apprenticeship combines classroom work with practical training. But many learn skills by acting as assistants or through informal teaching. High school education desirable.

Work Activities: Bricklayer spreads mortar, lays brick, removes excess mortar, bonds rows of brick. Works mainly on new construction but may do repair or alteration work and line furnaces. Concrete and cement mason pours and finishes concrete or cement; may lay floors of material such as terrazzo. Stonemason lays and finishes stone; may cut it to exact size, do stone veneer work, line vats, etc. with acid-resistant stone.

Painter applies paint, varnish, or similar materials to inside and/or outside of structures. Prepares surface to be painted; mixes paints, matches colors according to principles of color harmony. Erects scaffolding for work above ground. Painters often do paperhanging also. Many work for contractors on new construction; others for firms owning property; some self-employed.

Roofer applies roofing materials, such as felt, composition, tile, and slate, to roofs and waterproofs other surfaces of buildings. Cuts materials to fit roof and waterproofs points where angles intersect. May help build swimming pools; also do repairs. May work for roofing contractors when working on new buildings; some work for government agencies, businesses, etc., some self-employed.

Plasterer applies foundation coats, plaster, and finishing coat to interior surfaces; cement, plaster or stucco to outer surfaces of buildings. May decorate surfaces. Works mainly on new construction and alterations; sometimes on repair and maintenance.

Outcomes: Properly constructed or finished structures or parts of structures.

Supervision; Social Relations: Bricklayer may work for contractor, for industrial establishments, or be self-employed. Concrete and cement masons may work for general contractors or concrete contractors who bid for concrete work on construction job, for public works, utilities organizations, or private businesses, or be self-employed. Stonemasons usually work on new construction, some for government agencies and private business. Roofers, painters, and plasterers work under foreman, contractor, etc. Sometimes self-employed.

Salary; Other Benefits: All these occupations strongly unionized. Minimum pay rates vary according to geographical area. In 1970 minimum hourly wage for bricklayers averaged $6.77, for concrete and cement masons $6.02, for stonemasons $6.73. Minimum hourly rates for roofers about $6.17, for painters $5.95, for plasterers $6.35.

Role of Sexes: With a very few exceptions, these are men's fields.

PERSONAL CHARACTERISTICS

Project TALENT people who chose these occupations had the following characteristics in high school:

Interests: Highest score (70th percentile) in skilled trades; high (62nd percentile) in mechanical-technical, farming, and labor; lowest (37th percentile) in natural sciences, public service, literary-linguistic, and business management.

Similar to: Mining, Quarrying, etc.

Information

General: Average around 38th percentile on information scores; highest (39th percentile) in mathematics, physical science, and biological science; lowest (32nd percentile) in literature.

Specific: 42nd percentile in outdoor activities.

Abilities

General: Around the 40th percentile on ability scores; highest (43rd percentile) in creativity, mechanical reasoning, three-dimensional visualization, and arithmetic reasoning; lowest (26th percentile) in English.

Similar to: Mining, Quarrying, etc.

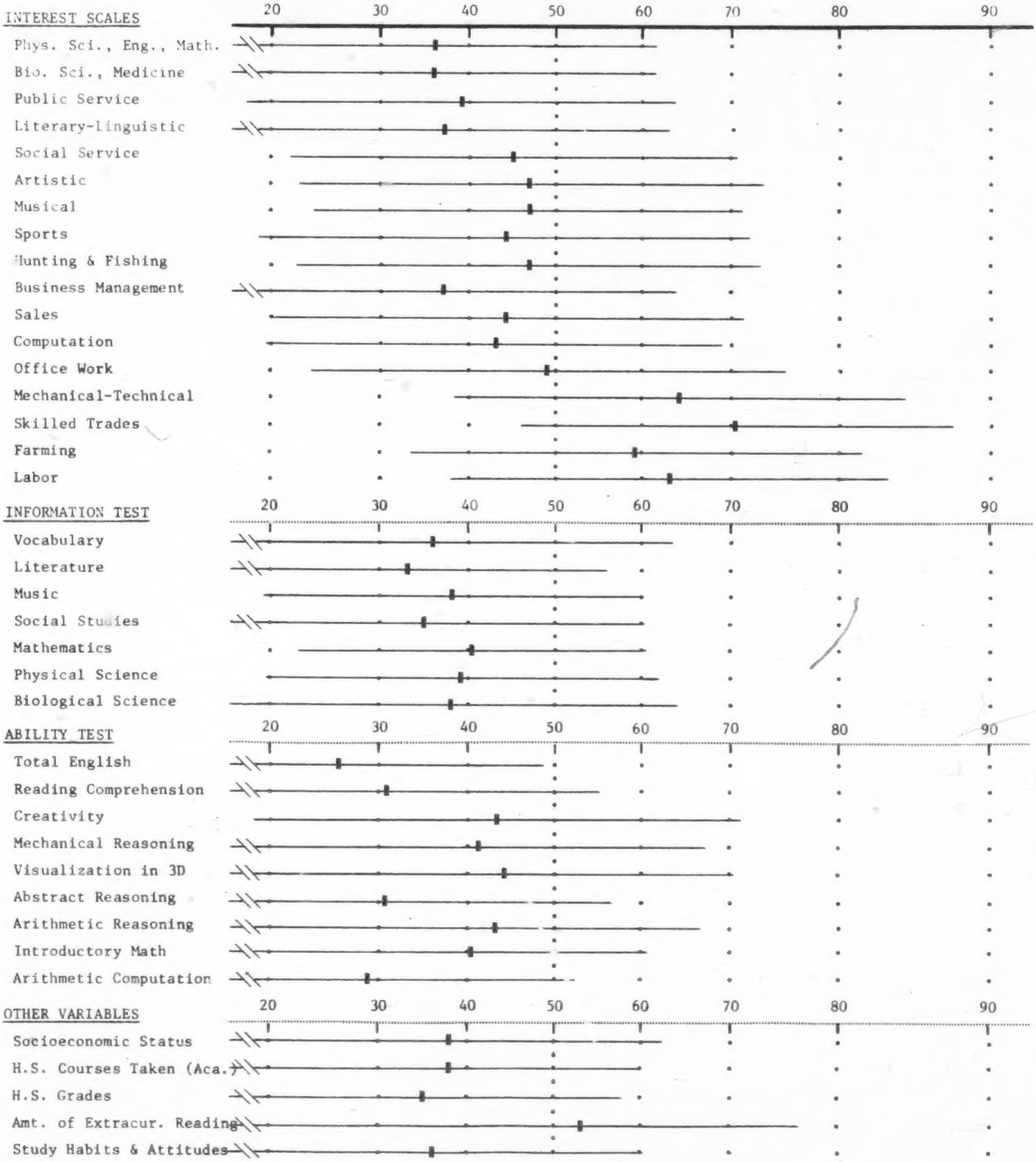
Others

General: High (53rd percentile) in amount of extracurricular reading; low (35th percentile) in high school grades.

Specific: 44th percentile in sociability.

BRICKLAYER, MASON, PAINTER, ROOFER, PLASTERER, etc.

(Male - n = 195)



BUILDING CONSTRUCTION - Miscellaneous

Importance: Many general laborers needed to prepare site and to assist construction specialists; explosives used for demolition and site preparation.

Training: Little formal training required for entry jobs but many general construction jobs demand considerable experience and skill, which worker has acquired on the job. For some of the more complex tasks contractors and unions have set up 4-8 week training programs. Use of explosives taught by blasting foreman.

Work Activities: Hod carriers serve journeyman workers by seeing that the materials they need to work with are at hand. Construction laborers load and unload materials, dig, carry materials and equipment, clear work areas, shovel and level earth, tear out old construction, fill concrete mixers, erect scaffolding, lay concrete, do rock blasting and drilling, bore tunnels.

Outcomes: Sites properly prepared, assistance given to journeymen, concrete laid, tunnels bored.

Supervision; Social Relations: Hod carriers and construction laborers supervised by the journeyman they assist or by foreman. Explosive worker supervised by blasting foreman.

Salary; Other Benefits: In 1970 bricklayers' tenders averaged $5.06 per hour and building laborers $4.78 per hour.

Role of Sexes: Almost entirely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (63rd percentile) in mechanical-technical, skilled trades, farming, and labor; lowest (40th percentile) in natural sciences, public service, literary-linguistic, business management, and sales.

Similar to: Foreman (not elsewhere classified)

Information

General: Average around 42nd percentile on information scores; highest (46th percentile) in mathematics, and biological science; lowest (38th percentile) in vocabulary, and social studies.

Specific: 45th percentile in outdoor activities.

Abilities

General: Around the 42nd percentile on ability scores; highest (47th percentile) in mechanical reasoning, three-dimensional visualization, and introductory mathematics; lowest (35th percentile) in English.

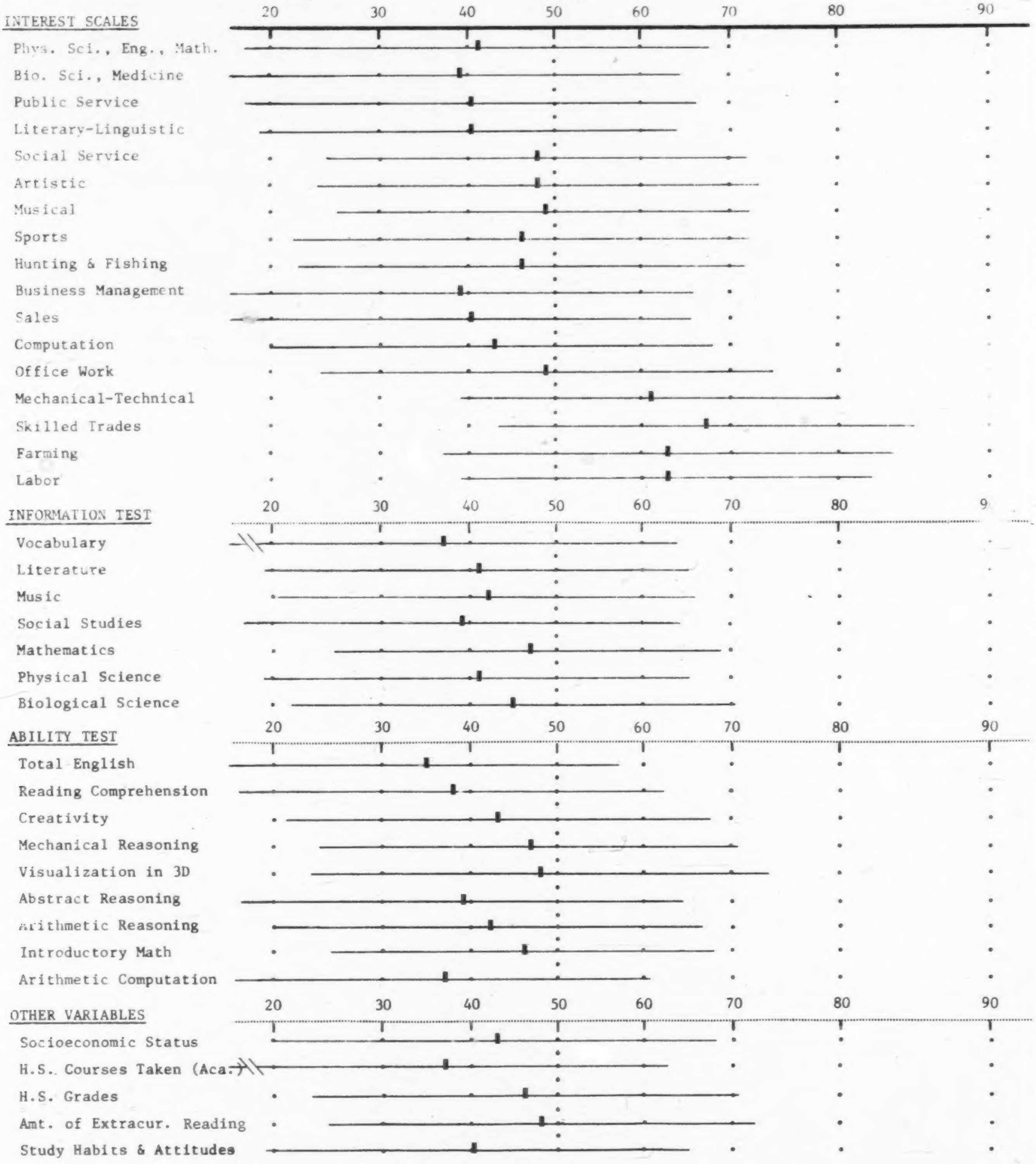
Others

General: High (48th percentile) in extracurricular reading; low (37th percentile) in academic orientation of high school courses.

Specific: 45th percentile in sociability.

BUILDING CONSTRUCTION - Miscellaneous

(Male - n = 190)



CARPENTER

Importance: Most houses still made of wood; wood used in finishing nearly all structures. Furniture, including built-in furniture, usually wood. Largest of building trades.

Training: 4-year apprenticeship recommended, but many carpenters acquire training informally, or by correspondence or trade school courses. Apprenticeship training combination of on-the-job training and classroom instruction. Must learn elementary structural design, making of concrete forms, indoor finishing, drafting and blueprint making, use of woodwork machines, etc.

Work Activities: Erects framework of buildings, builds temporary buildings and scaffoldings. Builds forms for pouring concrete. Finishes interiors; builds stairs, lays floors, may install floor coverings. In rural areas may do painting, roofing, etc. Does maintenance work. Most carpenters specialize in particular field, such as home or highway construction.

Outcomes: Properly constructed building, highway, or other structure; properly constructed part of structure, effective repair and maintenance.

Supervision; Social Relations: Carpenters working on new structures usually work for contractor or owner; others on self-employed basis, or may alternate. May work under carpenter foreman or general construction foreman.

Salary; Other Benefits: In 1970 union carpenters averaged minimum hourly wage of $6.42 hour plus benefits. Minimum hourly rates in 68 cities ranged from $4.45 to $8.10 hour plus benefits. Occupation strongly unionized. Apprentices start at about half of what they will make as journeymen.

Role of Sexes: With a very few exceptions this is a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (70th percentile) in skilled trades; high (62nd percentile) in mechanical, technical, farming, and labor; lowest (36th percentile) in natural sciences, public service, literary-linguistic, and business management.

Similar to: Heavy Equipment Operator, and Plumber, Pipefitter

Information

General: Average around 36th percentile on information scores; highest (40th percentile) in mathematics, physical and biological sciences; lowest (33rd percentile) in vocabulary, literature, and social studies.

Specific: 46th percentile in architecture.

Similar to: Heavy Equipment Operator, and Plumber, Pipefitter

Abilities

General: Around the 43rd percentile on ability scores; highest (56th percentile) in three-dimensional visualization; lowest (30th percentile) in English, reading comprehension, and arithmetic computation.

Specific: Table reading 58th percentile.

Similar to: Heavy Equipment Operator, and Plumber, Pipefitter

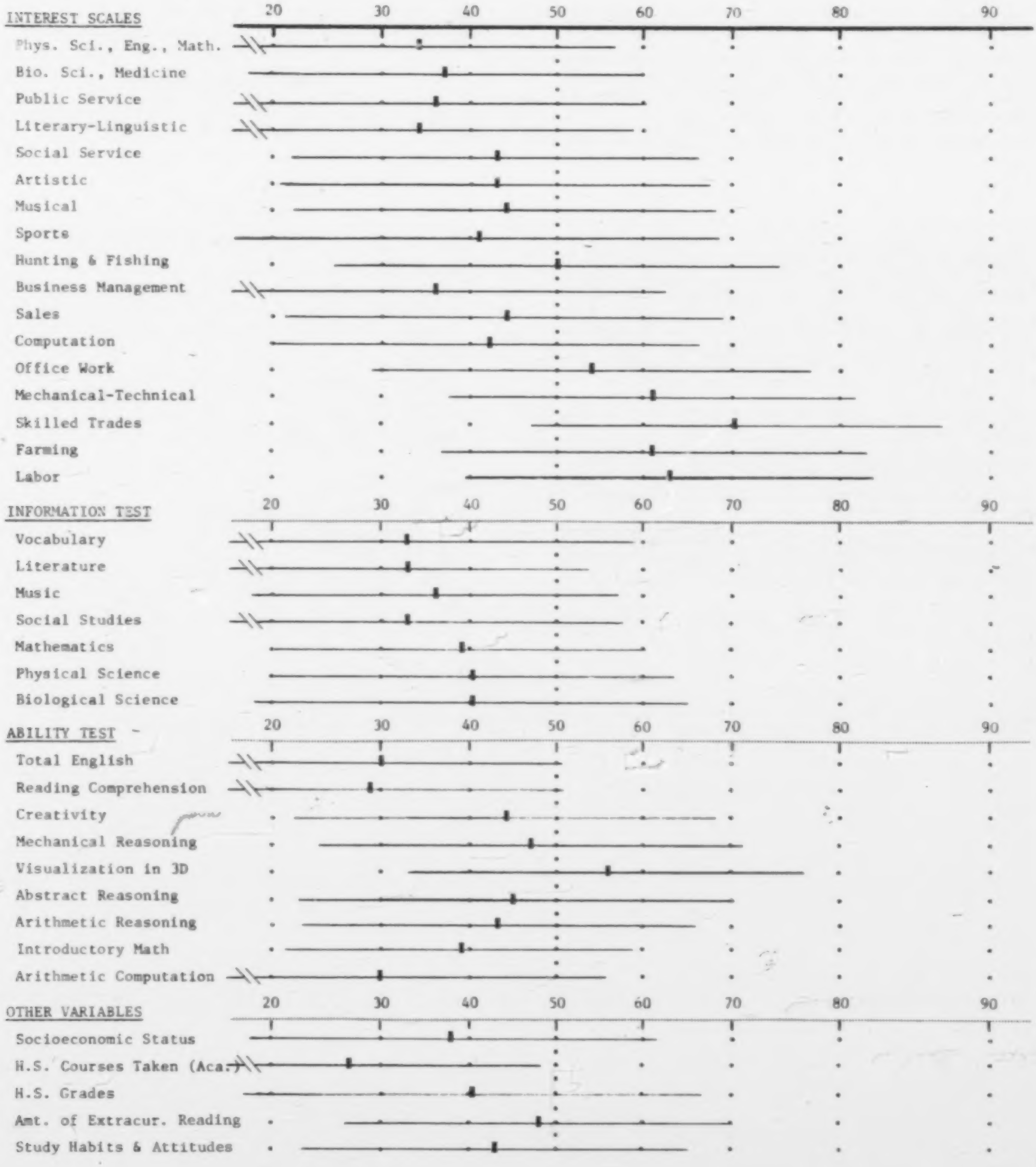
Others

General: High (48th percentile) in amount of extracurricular reading; low (27th percentile) in academic course orientation.

Specific: 43rd percentile in sociability.

CARPENTER

(Male - n = 180)



FOREMAN (not elsewhere classified)

Importance: Plan and direct the efforts of the workers, act as contact between workers and management.

Training: Usually no formal educational requirements, but most foremen are high-school graduates who have come up through the ranks of workers. Must know all aspects of job workers are doing.

Some companies now taking college graduates as foreman trainees, especially in industries where scientific knowledge is important. For such men, business training valuable. Leadership qualities essential.

Work Activities: Foreman plans and schedules the work to be done, estimates efficiency of workers, represents company to worker and worker to company. Advises on promotions, pay changes. Sees to it that work gets done on schedule. Deals with problems of workers. Takes care of disciplinary action. Sees that labor-management agreements are kept. In some industries also works along with the workers as "working foreman." Foremen work mainly in manufacturing, construction, and service industries.

Outcomes: Work proceeding on schedule; workers properly supervised.

Supervision; Social Relations: Usually supervised by next higher level of management. Respect of workers essential; tact necessary in acting as go-between for workers and management.

Salary; Other Benefits: Foreman paid more per hour than workers but usually gets no overtime. In 1969, median salary of full-time foremen $9,493.

Role of Sexes: About 90% of foremen men, but some women in clothing, electrical machinery, and leather manufacture; and in laundry and dry cleaning.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (61st percentile) in mechanical-technical, skilled trades, farming, and labor; lowest (45th percentile) in literary-linguistic, sports, and business management.

Similar to: Building Construction/Miscellaneous

Information

General: Average around 47th percentile on information scores; highest (51st percentile) in biological science; lowest (46th percentile) in literature.

Abilities

General: Around the 47th percentile on ability scores; highest (50th percentile) in creativity, mechanical reasoning, and three-dimensional visualization; lowest (37th percentile) in arithmetic computation.

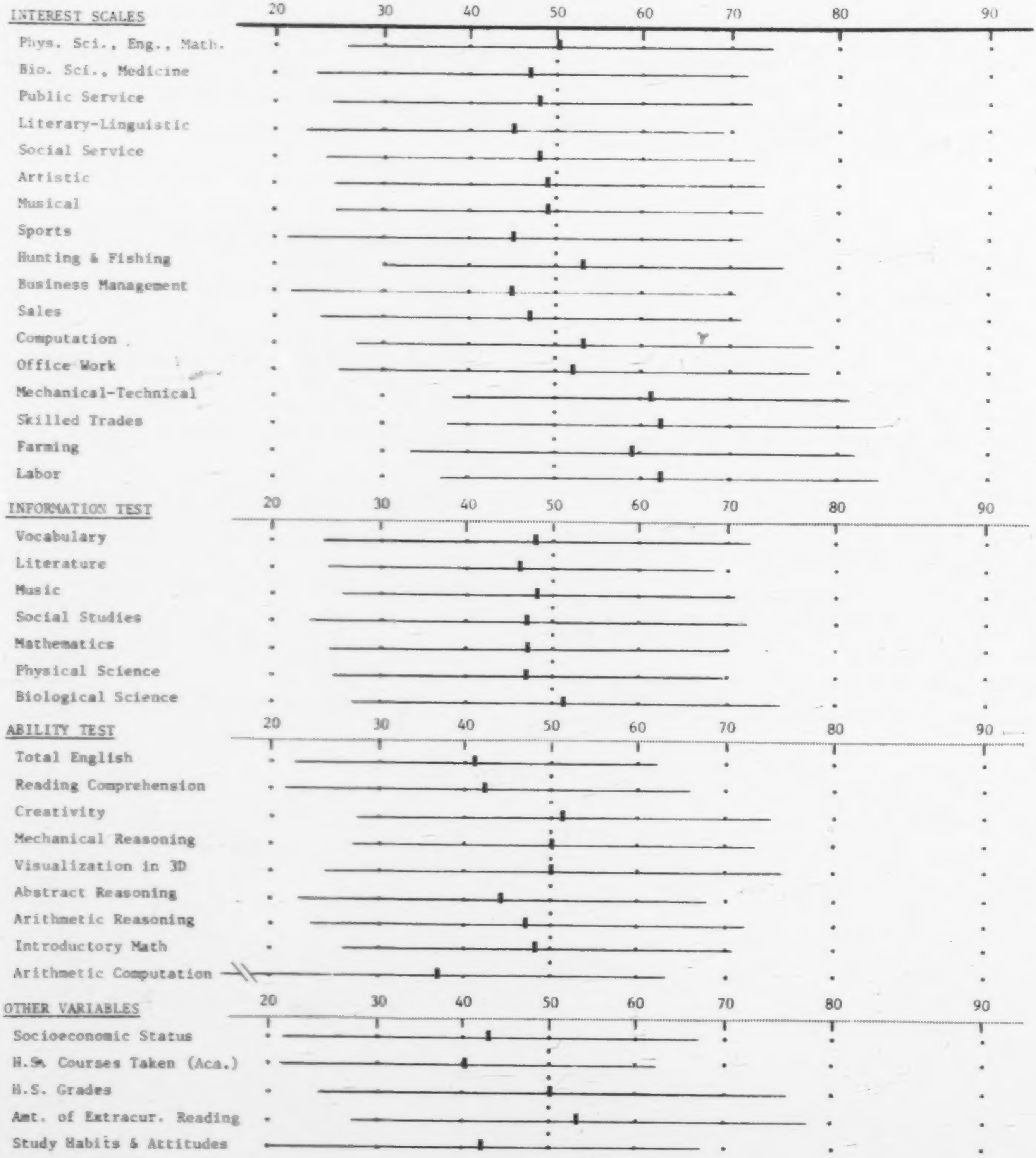
Others

General: High (53rd percentile) in amount of extracurricular reading; low (40th percentile) in academic course orientation.

Specific: High (55th percentile) in self-confidence; 53rd percentile in sociability, and social sensitivity.

FOREMAN (not elsewhere classified)

(Male - n = 262)



HEAVY EQUIPMENT OPERATOR

(Operating engineers; construction machinery operators)

Importance: Needed in nearly all construction work, in factories, in mines. Make possible the preparation of a site and moving of materials with minimum manpower. Essential in roadbuilding.

Training: Three-year apprenticeship program recommended. May train in universal equipment (hoists, shovels, cranes, etc.), in grading and paving equipment, or in plant equipment such as mixing and crushing machines. Also learn repair of machines. Given on-the-job training plus related classroom instruction. Should be between 18 and 30, in good physical condition and with high school education or equivalent.

Some learn trade by starting as oilers or helpers and getting informal training. If experienced with farm machinery may get entry jobs operating the simpler machines.

Work Activities: Operates and maintains power-driven construction machinery such as power shovels, hoists, pile drivers, concrete mixers, derricks. One operator may work with several types of machines. Manipulates attachments, sets controls, checks operation. Works on highway, dam, and other engineering projects as well as on construction. May operate machinery for moving materials in factories and mines. Maintains and repairs machines.

Outcomes: Roads and highways constructed, sites prepared, piles driven, materials moved, pavements and pipes laid.

Supervision; Social Relations: Most heavy equipment operators employed by contractors; a few self-employed. Some employed by factories, mines, public works, highway departments, etc.

Salary; Other Benefits: Occupation strongly unionized. Survey of 68 large cities in 1970 showed hourly pay of crane operators to range from $4.70 to $8.35 an hour. Bulldozer operators earned $3.90 to $7.85 an hour. Pay usually higher for the more complex machines. Work may be physically tiring; operator may not be fully employed during cold months.

Role of Sexes: Very few women in this field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (56th percentile and above) in hunting and fishing, mechanical-technical, skilled trades, farming, and labor; lowest (33rd percentile) in literary-linguistic.

Similar to: Carpenter, and Plumber, Pipefitter

Information

General: Average around 38th percentile on information scores; highest (40th percentile) in biological science; lowest (30th percentile) in vocabulary.

Specific: 41st percentile in outdoor activities.

Similar to: Carpenter, and Plumber, Pipefitter

Abilities

General: Around the 37th percentile on ability scores; highest (42nd percentile) in mechanical reasoning, and three-dimensional visualization; lowest (30th percentile) in English, and arithmetic computation.

Similar to: Carpenter, and Plumber, Pipefitter

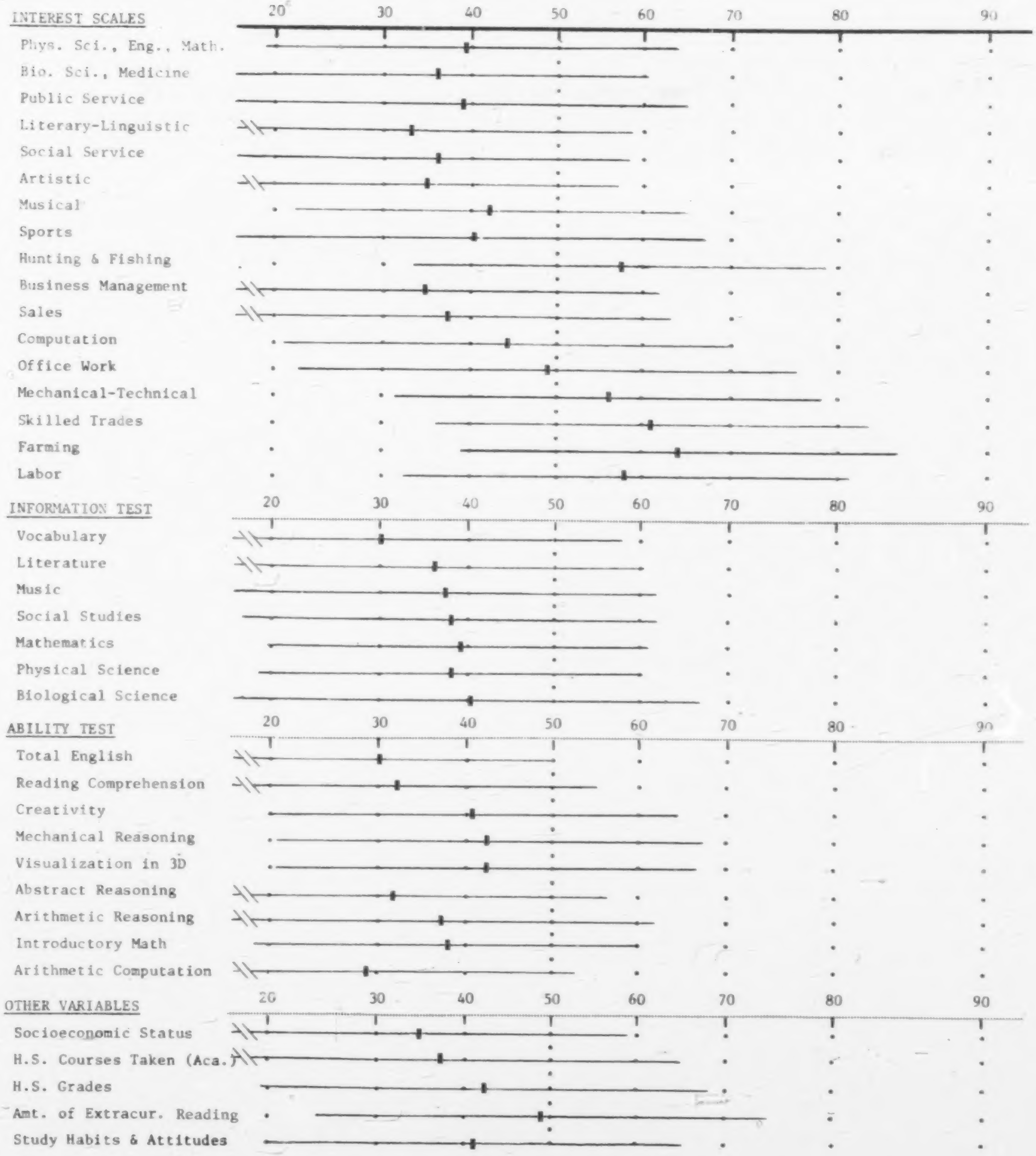
Others

General: High (49th percentile) in amount of extracurricular reading; low (35th percentile) in socioeconomic status.

Specific: 41st percentile in sociability.

HEAVY EQUIPMENT OPERATOR

(Male - n = 119)



MINING, QUARRYING, etc.

Importance: Mining supplies needed raw materials and energy sources such as minerals and coal. Quarrying supplies limestone, gravel, and clay useful in construction. Oil and natural gas drilling a necessary source of energy.

Training: Training usually obtained on the job. Usually no formal educational requirements, but jobs require experience and skill. Mechanical training useful.

Work Activities: Miner removes ore, coal, or rock from the earth. Uses power drill to bore blasting holes. Sets off explosives or air charges to loosen materials, then shovels them onto mine cars or conveyor belt. Also does work like installing timbering to hold up mine roof. May also do surface mining--removing earth from top of coal mass.

Quarryman uses wedges, jackhammers, etc. to separate blocks of roughly the desired size and shape from the rock mass in the earth. May use explosives. Chips blocks to uniform size, loads them for removal. May also quarry for gravel.

Oil-well driller constructs rig, attaches machinery, guides and repairs pipe and bit, drills wells, controls petroleum as it emerges.

Outcomes: Desired materials removed from the earth.

Supervision; Social Relations: May be supervised by foreman. Most oil drilling done under contractors. Driller has crew of helpers.

Salary; Other Benefits: Miners' income varies from very low, in independent strip-mining operations, to fairly good in highly unionized mining operations. In 1970 nonsupervisory employees in oil and gas extraction earned an average of $153.87 per week. Some oil drillers work in foreign countries.

Role of Sexes: Largely a man's field; some women employed as clerical workers, especially in petroleum and gas industry.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (67th percentile) in hunting and fishing, mechanical-technical, skilled trades, farming, and labor; lowest (43rd percentile) in public service, and artistic.

Similar to: Bricklayer, Mason, etc.

Information

General: Average around 33rd percentile on information scores; highest (38th percentile) in biological science; lowest (28th percentile) in literature and social studies.

Specific: 36th percentile in outdoor activities.

Abilities

General: Around the 32nd percentile on ability scores; highest (42nd percentile) in three-dimensional visualization, and arithmetic reasoning; lowest (28th percentile) in English, reading comprehension, and arithmetic computation.

Similar to: Bricklayer, Mason, etc.

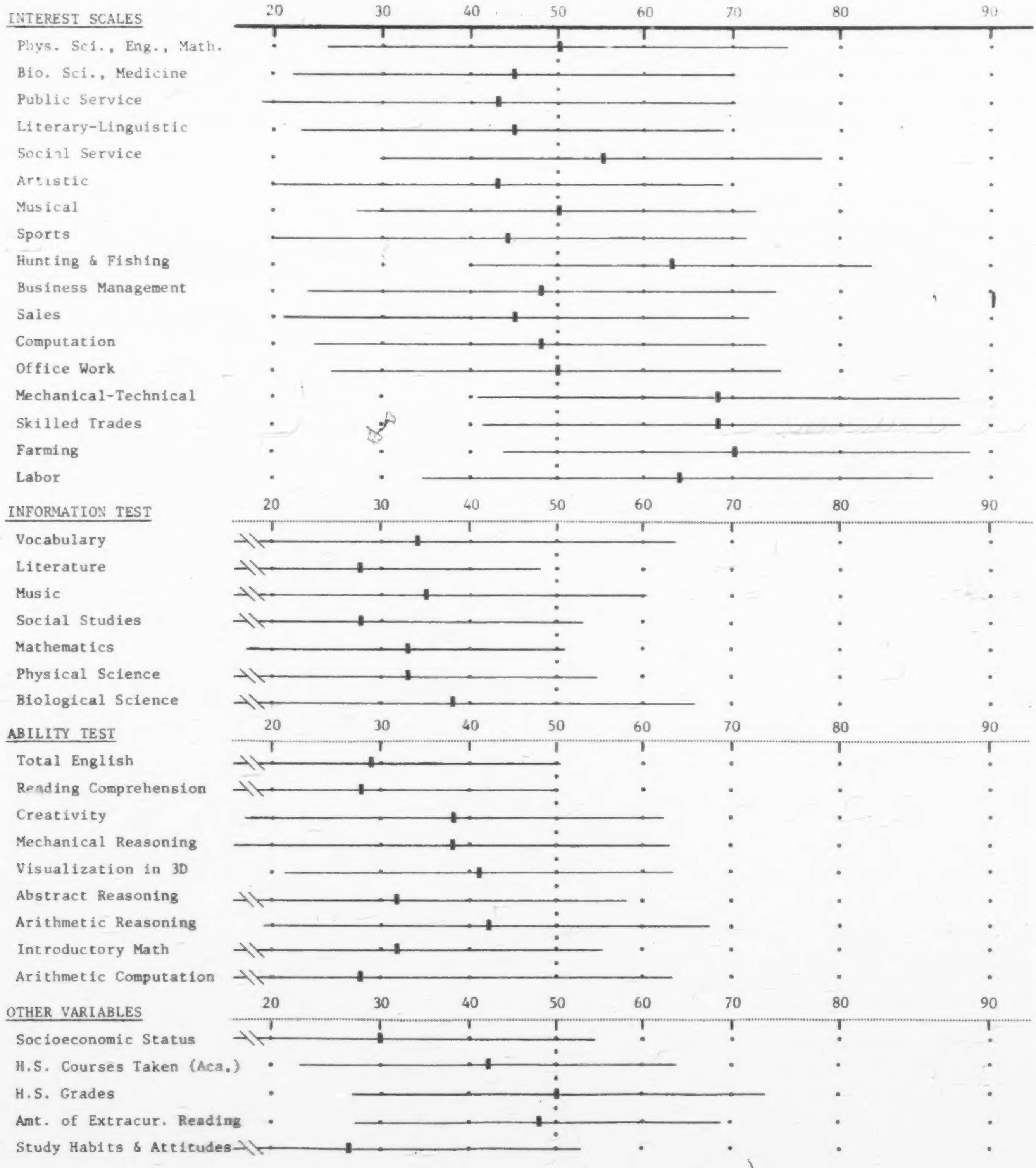
Others

General: High (50th percentile) in high school grades; low (27th percentile) in study habits and attitudes.

Specific: 58th percentile in sociability.

MINING, QUARRYING, etc.

(Male - n = 44)



PLUMBER, PIPEFITTER

Importance: Plumbing and pipefitting required for water, heating, and sewage systems in homes, factories, etc.; also in industries such as petroleum processing using extensive pipe systems.

Training: For plumbers and pipefitters, 5-year apprenticeship course recommended, combining practical and classroom instruction, but many learn skills informally as helpers or through instruction from experienced plumbers and pipefitters. Should have high school education with courses in math, physics, or chemistry. Aptitude tests often required for apprenticeship. Some communities require examination for journeyman's license. Most places require contractor to have master plumber's license.

Work Activities: Same man may be both plumber and pipefitter, or only one of two. Plumbers and pipefitters install and repair pipe systems carrying liquids and gases, and install plumbing, heating, and refrigerating equipment. Plumbers usually do water, gas, sewage, heating, air conditioning systems for new construction, and alterations and repair in existing buildings. Pipefitters install pipes carrying steam, etc., in industrial buildings, refrigeration plants, oil refineries, etc. Plumber or pipefitter may specialize in gas pipes, steam pipes, fire-prevention sprinkler systems. Both use testing instruments, welding, soldering, and brazing equipment. Furnace installers install oil, gas, electric heaters, pipes and wiring attached to them.

Most plumbers and pipefitters work for contractor on new construction. Many self-employed or work for plumbing contractors doing repairs or alterations. Some work for public utilities, on ship and aircraft construction, in chemical plants, oil refineries, etc.

Outcomes: Safe and properly functioning pipe systems, water heating, sewage, air conditioning, refrigeration systems.

Supervision; Social Relations: May be supervised by foreman or contractor; may be self-employed.

Salary; Other Benefits: In 1970, union minimum hourly wage in large cities about $7.01 for plumbers and $6.93 for pipefitters.

Role of Sexes: Largely a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (62nd percentile) in mechanical-technical, skilled trades, and labor; lowest (36th percentile) in physical science, and literary-linguistic.

Similar to: Carpenter and Heavy Equipment Operator

Information

General: Average around 40th percentile on information scores; highest (43rd percentile) in literature, mathematics, and biological science; lowest (35th percentile) in vocabulary.

Similar to: Carpenter and Heavy Equipment Operator

Abilities

General: Around the 42nd percentile on ability scores; highest (48th percentile) in introductory mathematics; lowest (32nd percentile) in English, reading comprehension, and arithmetic computation.

Specific: Table reading 55th percentile.

Similar to: Carpenter and Heavy Equipment Operator

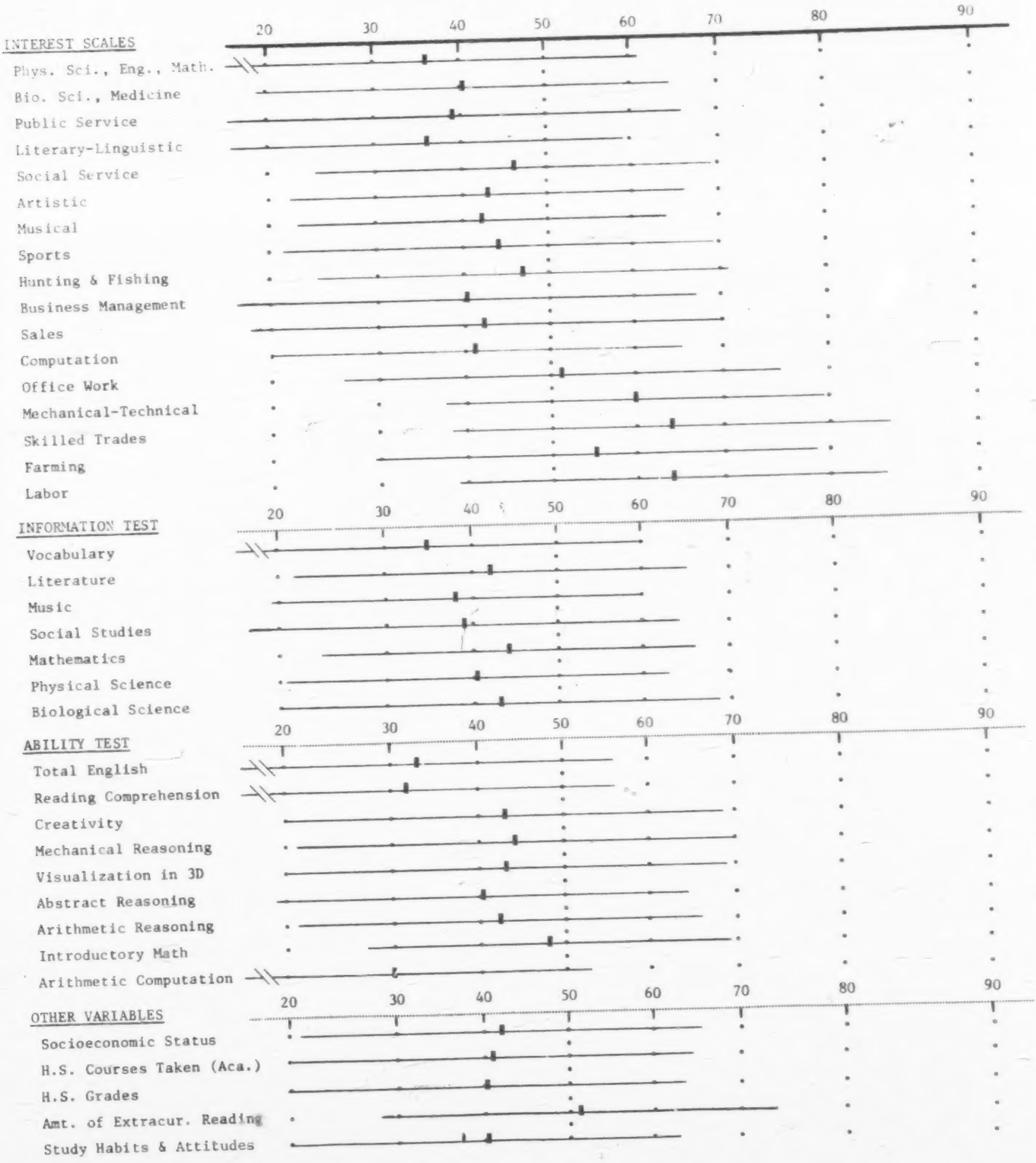
Others

General: High (51st percentile) in extracurricular reading; low (40th percentile) in high school grades, and study habits and attitudes.

Specific: 48th percentile in sociability.

PLUMBER, PIPEFITTER

(Male - n = 224)



CHAPTER 13

CAREER GROUP 11

Secretarial-Clerical, Office Worker

Secretaries and other clerical workers work in business and industry in a number of different ways. Their main responsibility is to take care of the record-keeping and paper work in all types of offices. Other duties may include handling communications such as mail, telephone, telegraph, and message service; and operating office machines and equipment. We have grouped the following jobs in Career Group 11:

- Account Recording Worker/Miscellaneous (Females) (a)
- Bookkeeper (Females) (b)
- Clerical Worker/Miscellaneous (C)
- Clerk
  - Bank (D)
  - Miscellaneous (Females) (e)
- Operator
  - Keypunch (Females) (f)
  - Radio, Telegraph, and Teletype (G)
  - Telephone (PBX) (Females) (h)
- Receptionist, Hotel Clerk, etc. (Females) (i)
- Secretary (not elsewhere classified) (Females) (j)
  - Legal (Females) (k)
  - Medical/Dental (Females) (l)
- Stenographer, etc. (Females) (m)
- Typist (Females) (n)

For most of these positions, a high school education is the minimum educational requirement. However, those who have completed training after high school in a business school or junior college have a better chance of obtaining a job.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest scores (58th percentile) in computation, skilled trades, and labor; lowest (46th percentile) in biological science and medicine, and artistic.

Information

General: Average around 51st percentile on information scores; highest (52nd percentile) in literature, and mathematics; lowest (46th percentile) in vocabulary.

Specific: High (51st percentile) in accounting, business and sales.

Abilities

General: Around the 50th percentile on ability scores; highest (55th percentile) in creativity, mechanical reasoning, arithmetic reasoning, and introductory math; lowest (42nd percentile) in arithmetic computation.

Specific: 53rd percentile in memory for words.

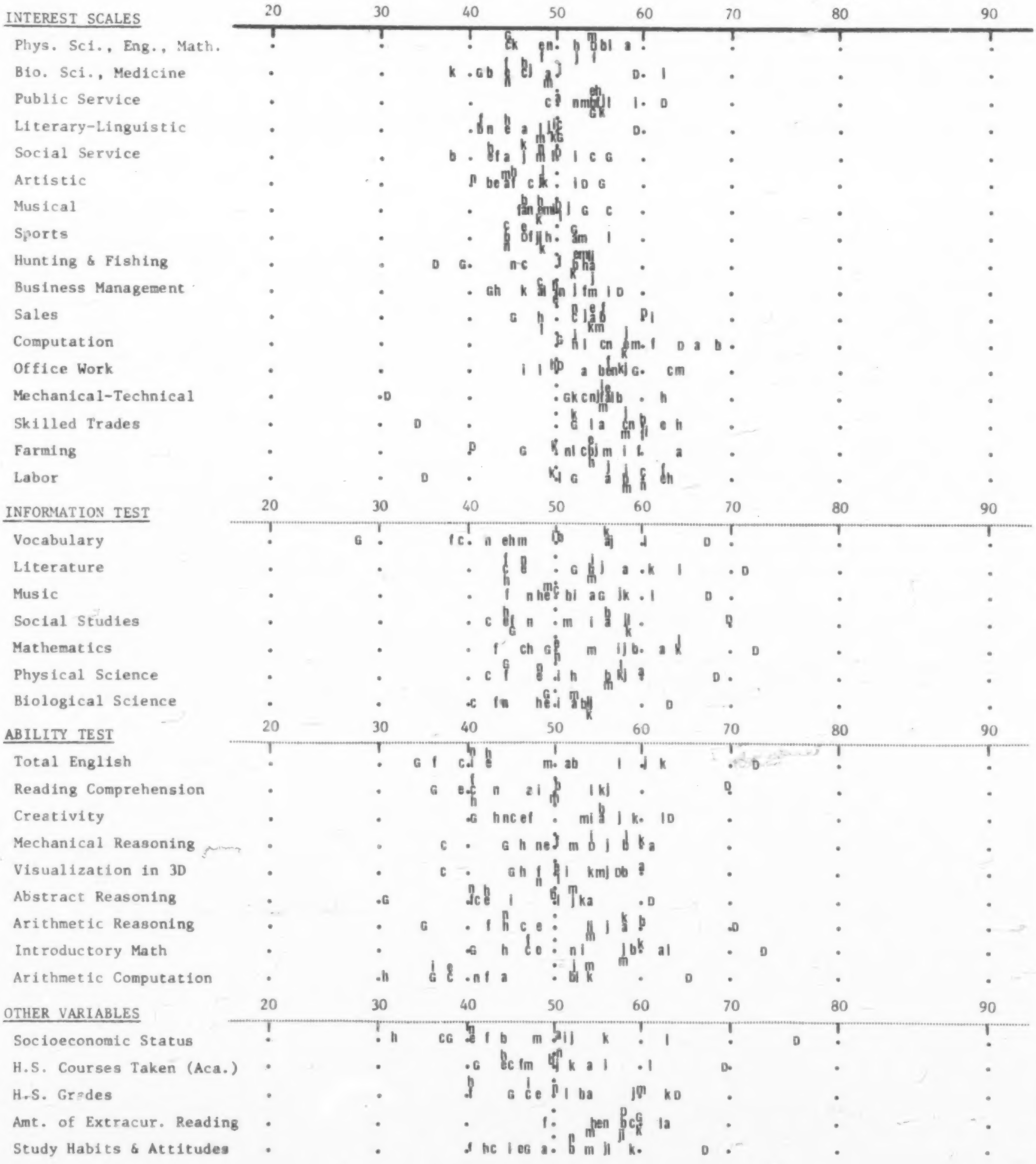
Others

General: High (58th percentile) in extracurricular reading; low (42nd percentile) in socioeconomic status.

Specific: 44th percentile in sociability; 48th percentile in self-perception of reading skills.

CAREER GROUP 11

Secretarial-Clerical, Office Worker



ACCOUNT RECORDING WORKER - Miscellaneous

See also Bookkeeper, p. 278; Clerical Worker, Miscellaneous, p. 280.

Importance: Modern business, finance, taxation and credit systems require a rapid and continuous accounting system.

Training: For these occupations, high school education usually necessary, plus arithmetical ability and accuracy. Courses in bookkeeping, business arithmetic, office machine operation helpful. Graduation from business school very desirable. Employer may require aptitude or clerical tests. Training on specific machine used may be given on the job or at special schools.

Work Activities: Account recording workers include miscellaneous computing and account-recording occupations such as bookkeeping machine operator, adding machine operator, desk calculator operator, statistical clerk, billing clerk, etc.

Bookkeeping machine operator records financial transactions of organization he works for. Machine helps prepare bookkeeping forms, trial balances, reports, etc. Adding machine operator uses machines to make computations for payroll, invoices, statistics. Calculating machine operator gets totals, remainders, percentages, square roots, etc. May also do other office work. Statistical clerk compiles statistics, usually by machine. Billing clerk uses machines to record charges, as in hotel or hospital.

Account recording workers used in business, education, government.

Outcomes: Accounts promptly and correctly recorded; statistics compiled.

Supervision; Social Relations: Usually supervised by superior in office, as head statistical clerk; in small office by office manager or employer.

Salary; Other Benefits: In 1970, class A bookkeeping machine operators earned an average of $105.50 per week if women and $113.50 if men. Billing machine operators' average weekly salary was $92.00 for women and $127.00 for men.

Role of Sexes: About three-quarters of workers operating office machines are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (65th percentile) in computation, and farming; lowest (44th percentile) in social service, and artistic.

Information

General: Average around 56th percentile on information scores; highest (61st percentile) in mathematics, and physical science; lowest (52nd percentile) in biological science.

Specific: 58th percentile in accounting, business and sales.

Abilities

General: Around the 55th percentile on ability scores; highest (62nd percentile) in introductory mathematics; lowest (44th percentile) in arithmetic computation.

Specific: 67th percentile in table reading.

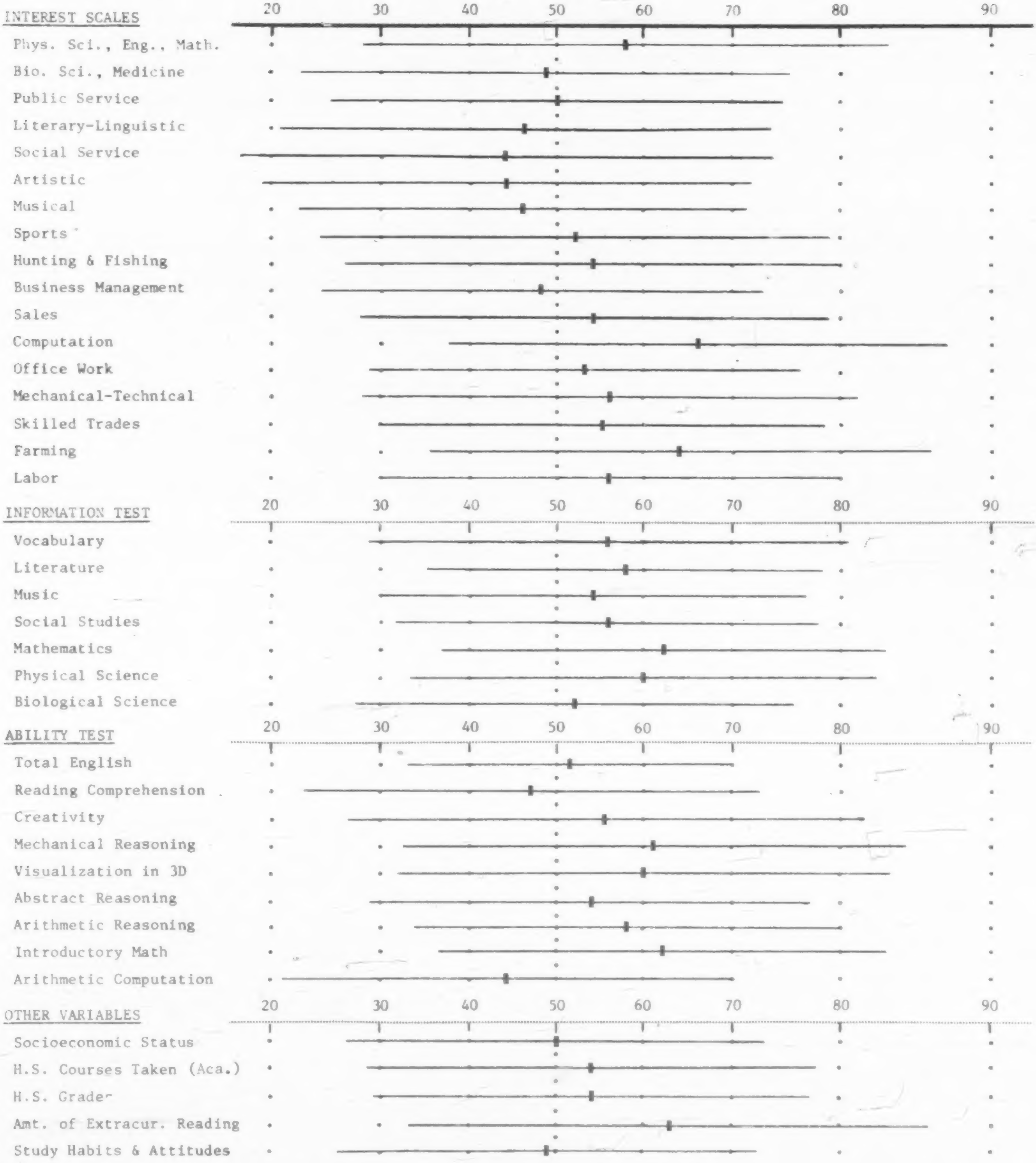
Others

General: High (63rd percentile) in extracurricular reading; low (50th percentile) in socioeconomic status, and study habits and attitudes.

Specific: 50th percentile in sociability, and self-perception of reading skills.

ACCOUNT RECORDING WORKER - Miscellaneous

(Female - n = 170)



BOOKKEEPER

Importance: Business needs financial records to make and collect payments and to determine efficiency of various activities; government requires business to keep financial records.

Training: Need good arithmetic aptitude and capacity for attention to detail. High school graduates preferred; business training desirable. May have learned business arithmetic and bookkeeping in high school courses, may have had business training in trade school or junior college, or may have had on-the-job training as accounting clerk. Knowledge of typing and use of office machines desirable and sometimes necessary. For jobs in banks, etc., aptitude tests may be required.

Work Activities: Bookkeepers sometimes called bookkeeping and accounting clerks. Record business transactions, income and outgo. Prepare income statements. May use adding machines. In small offices may also file, answer phone, send out bills, etc. In large offices may specialize in some particular kind of work.

Bookkeepers working in banks called bank clerks. May be Christmas club bookkeeper, discount bookkeeper, interest-accrual bookkeeper, trust bookkeeper.

Outcomes: Financial records correctly kept; additional duties, if any, accomplished.

Supervision; Social Relations: In large office under head bookkeeper. In small office usually under head of office.

Salary; Other Benefits: In 1970 beginning accounting clerks averaged $439 a month, more experienced ones $568 a month. Highest salaries usually paid by large firms in urban areas or by public utilities.

Role of Sexes: Nine-tenths of bookkeepers women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (68th percentile) in computation; lowest (38th percentile) in social service.

Information

General: Average around 54th percentile on information scores; highest (59th percentile) in mathematics; lowest (51st percentile) in vocabulary, and music,

Specific: High (61st percentile) in accounting, business and sales.

Abilities

General: Around the 55th percentile on ability scores; highest (60th percentile) in arithmetic reasoning, and introductory mathematics; lowest (50th percentile) in reading comprehension, and abstract reasoning.

Specific: Table reading at 62nd percentile.

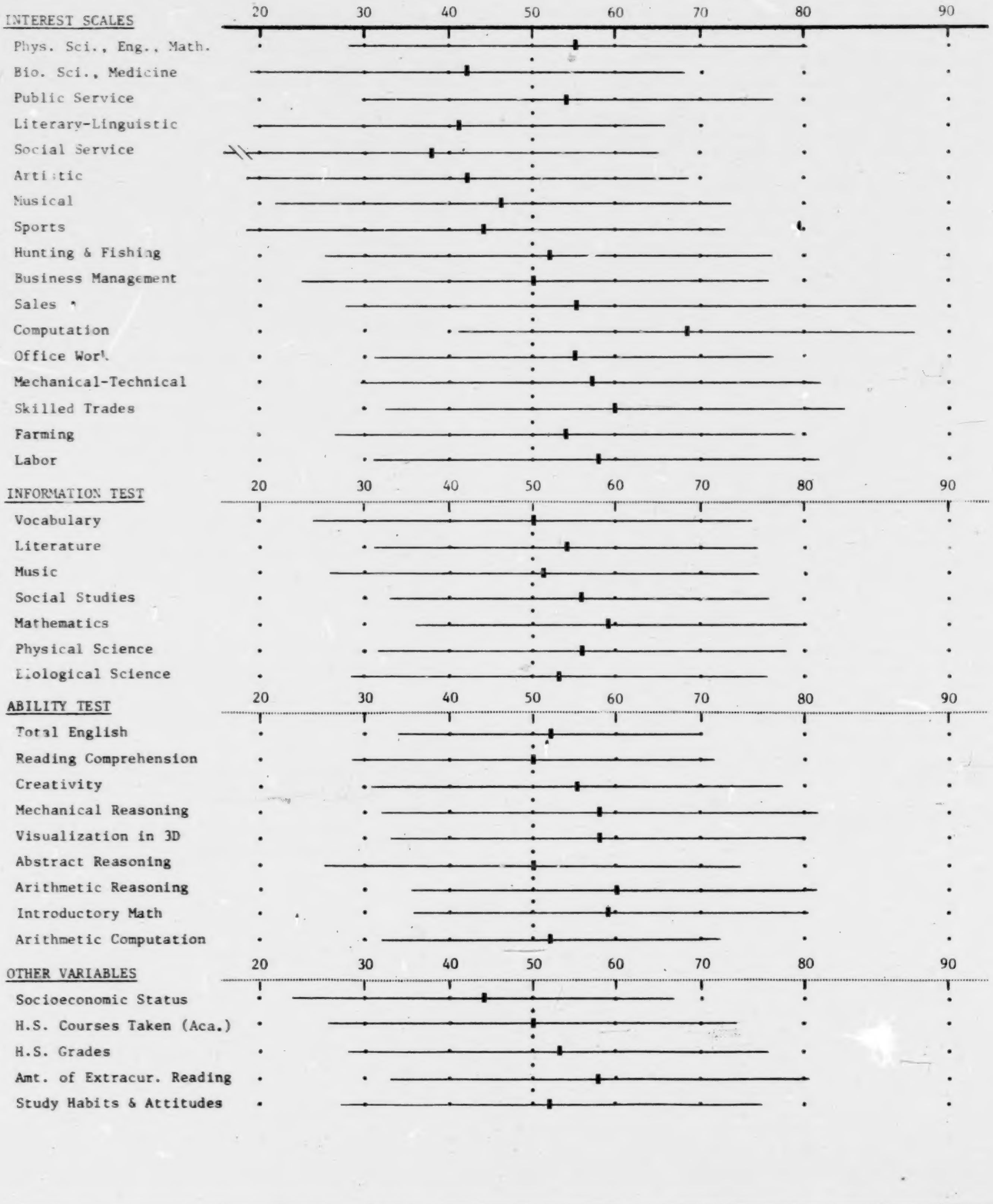
Others

General: High (58th percentile) in amount of extracurricular reading; low (44th percentile) in socioeconomic status.

Specific: 46th percentile in sociability, and self-perception of reading skills.

BOOKKEEPER

(Female - n = 399)



CLERICAL WORKER - Miscellaneous

Importance: Specialized clerical jobs important in functioning of businesses and institutions.

Training: Dependent on type of work done.

For duplicating machine operator, on-the-job training which for some machines is only a few days. For entry job only general knowledge of equipment required. For some office machine operators several weeks on-the-job training required. May be trained in schools run by machine manufacturers. Should be high school or business school graduate; knowledge of typing helpful.

For shipping and receiving clerk, high school graduates preferred. High school business subjects such as arithmetic and typing helpful. Must write legibly. Usually trained on the job. For stock clerk or inventory clerk, high school diploma preferred but not essential. Must be good at reading, writing, arithmetic, typing, filing. Usually given several weeks of on-the-job training.

There are no formal educational requirements for postal or mail clerks but the subject must pass a civil-service examination.

Work Activities: Duplicating machine operator makes multiple copies of required documents; keeps machine adjusted; may feed in paper and remove finished work. Operators of other machines include billing, bookkeeping, adding and calculating machine, mail handling machine, tabulating machine, etc. operators. Shipping and receiving clerk checks on goods being shipped or received by employer. Prepares invoices, records shipment, keeps records. May pack and unpack shipments. Verifies accuracy of order and condition of shipments. Stock clerk may act as receiving clerk, shipping clerk, inventory clerk, or in small firms may act as all of these. Checks on condition and quality of stock; reports and replaces damaged and spoiled goods, stores materials, may put prices on. Records goods entering or leaving stockroom; may prepare inventories. Postal or mail clerks sort and deliver mail, sell stamps, weigh packages, check incoming mail, write and cash money orders.

Outcomes: Assigned clerical and other work correctly performed.

Supervision; Social Relations: Supervised by superior in office or department.

Salary; Other Benefits: In 1970 billing machine operators averaged $92 per week for women and $127 for men. Class A bookkeeping machine operators averaged $105.50 weekly for women and $113.50 for men. Female comptometer operators averaged $97.00 weekly.

In metropolitan areas shipping and receiving clerks averaged $3.07 per hour. Stock clerks averaged $125 per week for men and $92 per week for women. Stock clerks working for federal government earned about $110-$140 per week. Postal and mail clerks in 1973 started at $4.22 an hour; the average annual pay of postal employees was about $10,000.

Role of Sexes: Some women work as radio operators; most teletypists are women. About three-fourths of office machine operators are women. Shipping and receiving clerks usually men because of physical strength required. Women sometimes used as stock clerks. Postal or mail clerks may be either men or women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (63rd percentile) in office work; lowest (44th percentile) in physical science, and sports.

Information

General: Average around 42nd percentile on information scores; highest (50th percentile) in music; lowest (39th percentile) in vocabulary.

Specific: 44th percentile in accounting, business and sales.

Abilities

General: Around the 40th percentile on ability scores; highest (47th percentile) in arithmetic reasoning, and introductory mathematics; lowest (37th percentile) in mechanical reasoning, three-dimensional visualization, and arithmetic computation.

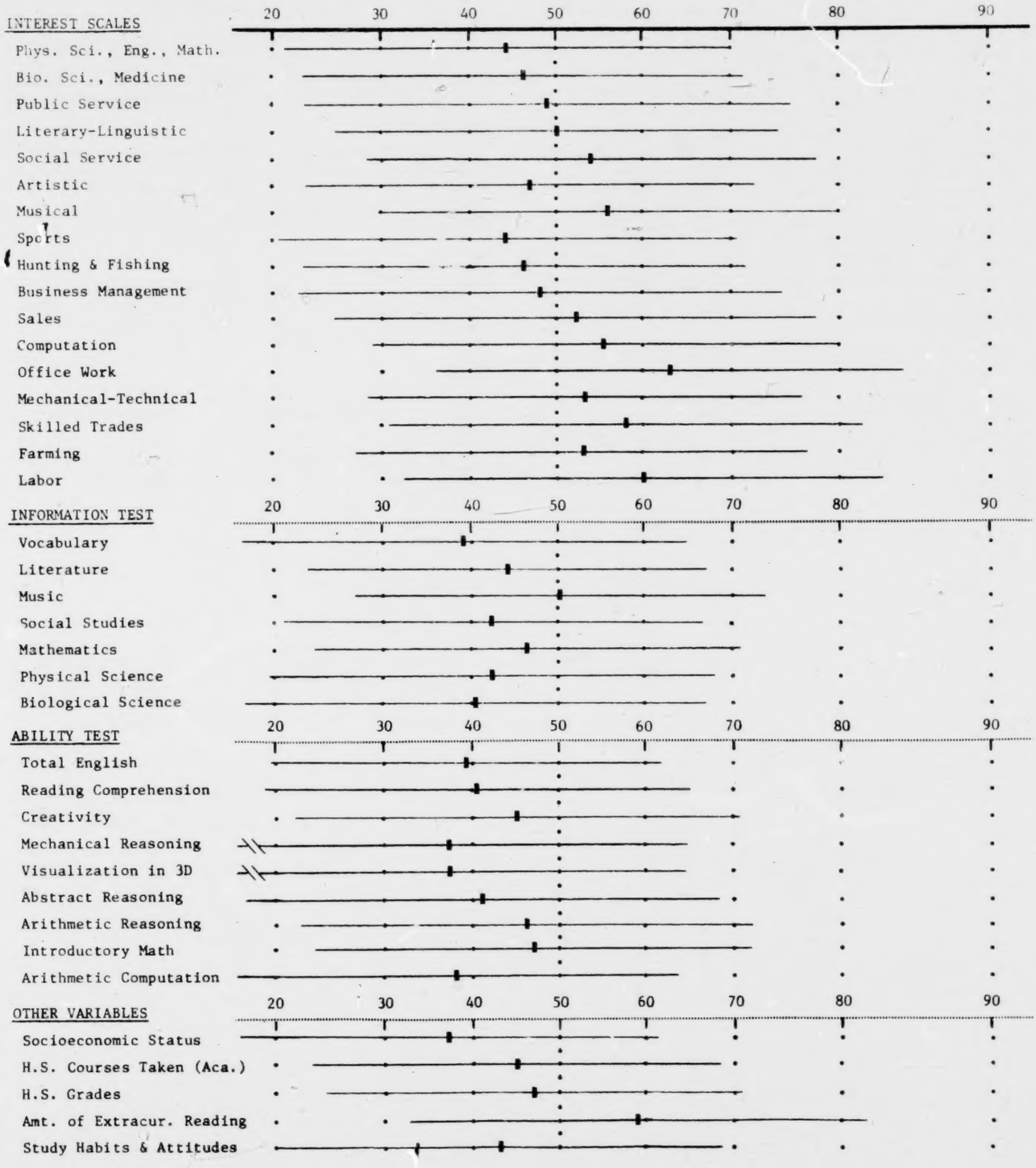
Others

General: High (59th percentile) in amount of extracurricular reading; low (37th percentile) in socioeconomic status.

Specific: 49th percentile in sociability, and self-perception of reading skills.

CLERICAL WORKER - Miscellaneous

(Male - n = 323)



CLERK - Bank

Importance: Needed to keep banking system functioning.

Training: Should be high-school graduates. Courses in bookkeeping, business arithmetic, typing, etc. desirable. Clerical aptitude tests may be required. May get on-the-job training or take correspondence courses offered by American Institute of Banking.

Work Activities: Do paperwork connected with bank accounts, loans, etc. May have various duties in small bank or only one in large bank. May be sorters who sort documents, proof machine operators, bookkeeping machine operators, account clerks, posting machine operators, recording clerks, bookkeepers, Christmas club bookkeepers, reconcilement clerks, trust investment clerks, exchange clerks, check inscribers or encoders, console operators, teletype operators, etc.

Outcomes: Bank records correctly kept and necessary correspondence carried on.

Supervision; Social Relations: Supervised by superior in department. Must be able to work independently.

Salary; Other Benefits: In 1970 male bank clerks averaged between $80 and $130 per week. Class A accounting clerks averaged $123 and tabulating machine operators $131; office boys $77.

Role of Sexes: In 1970 about 9 out of 10 bank clerks were women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (64th percentile) in computation; lowest (31st percentile) in mechanical-technical.

Information

General: Average around 68th percentile on information scores; highest (72nd percentile) in mathematics; lowest (63rd percentile) in biological science.

Specific: 71st percentile in accounting, business and sales.

Abilities

General: Around the 65th percentile on ability scores; highest (73rd percentile) in English, and introductory mathematics; lowest (54th percentile) in mechanical reasoning.

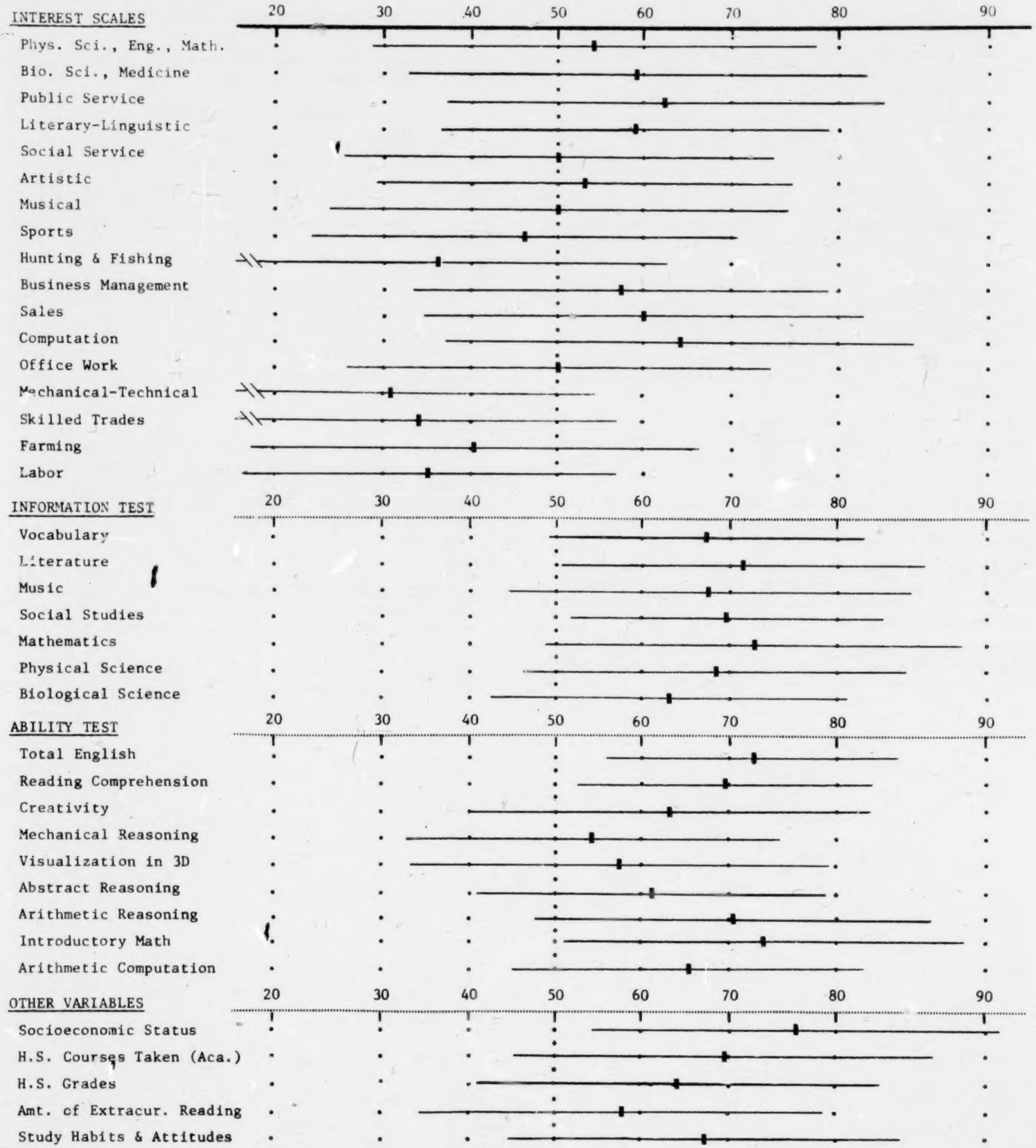
Others

General: High (76th percentile) in socioeconomic status; low (58th percentile) in extracurricular reading.

Specific: 54th percentile in sociability; 60th percentile in self-perception of reading skills.

CLERK - Bank

(Male - n = 334)



CLERK - Miscellaneous

Importance: Clerks needed in nearly all offices, organizations, and projects to keep records, transact necessary business, handle communications, and relieve employers and superiors of tasks they would otherwise have to perform themselves.

Training: High school education usually necessary; graduation from high-school business curriculum helpful. Many have had some college or business-school courses. Should be able to read and spell well; if a general clerk should be accurate in arithmetic. Clerical aptitude tests may be required. Nearly always get some on-the-job training. May be sent to classes to learn to operate business machines they are to use. Typing desirable in some places and necessary in others.

Work Activities: File clerk takes care of company's records, organizing them according to a filing system and finding individual documents when needed. Keeps track of whereabouts of documents removed from files and sees that they are returned. Prepares labels, cards, etc. for files. May modify filing system to meet new needs.

General office clerk may also do some filing. May act as receptionist, answer telephone, type letters, send out bills. In small office duties varied; in large office may be specialized.

Outcomes: For file clerks, records properly filed and easily locatable. For general office clerk, routine work of office competently carried on.

Supervision; Social Relations: File clerk may work under file clerk supervisor or under general office supervisor. General office clerk usually works under office supervisor, office head, or employer.

Salary; Other Benefits: In 1970 beginning file clerks averaged $80 a week, those with some experience $88, and the most experienced and skilled $106. In 1968-69 clerical salaries ranged upward from about $70 a week. Men usually paid more than women.

Role of Sexes: Most, but not all, file clerks and general office clerks are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (62nd percentile) in skilled trades, and labor; lowest (43rd percentile) in biological science, literary-linguistic, social service, and artistic.

Information

General: Average around 48th percentile on information score; highest (49th percentile) in music, mathematics and biological science; lowest (44th percentile) in vocabulary, and social studies.

Specific: 49th percentile in accounting, business and sales.

Abilities

General: Around the 46th percentile on ability scores; highest (49th percentile) in mechanical reasoning, three-dimensional visualization, arithmetic reasoning, and introductory math; lowest (39th percentile) in reading comprehension, and arithmetic computation.

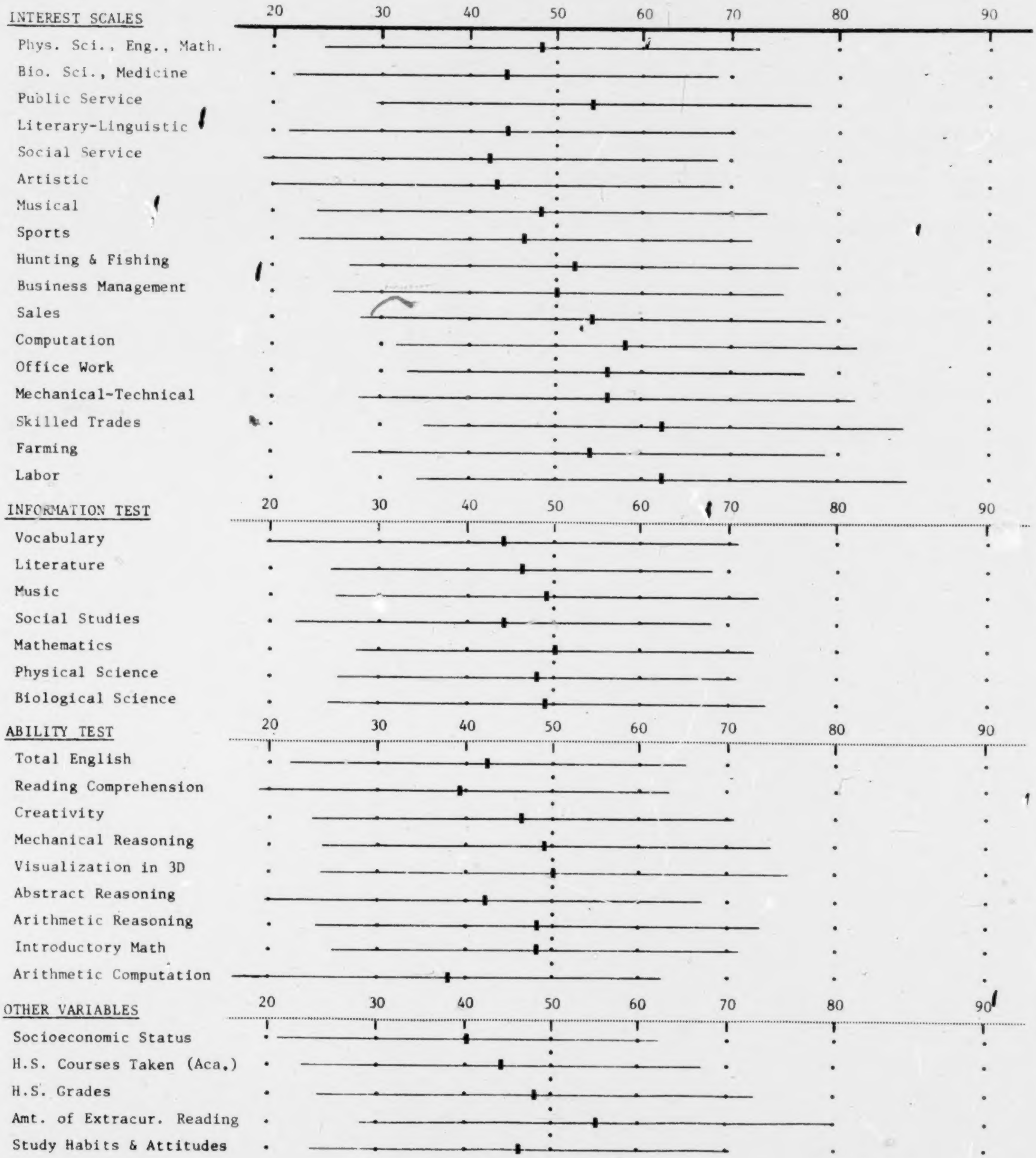
Others

General: High score (55th percentile) in extracurricular reading; low (42nd percentile) in socioeconomic status, and academic orientation of high school courses.

Specific: 42nd percentile in sociability; 38th percentile in self-perception of reading skills.

CLERK - Miscellaneous

(Female - n = 389)



OPERATOR - Keypunch

Importance: Prepares input material for computer to work on.

Training: May be trained on the job or by taking courses in vocational high school, trade school, etc. High accuracy necessary.

Typical Work Activities: Prepares punched cards on which the holes represent specific information.

Outcomes: Correct and properly prepared input for the computer.

Supervision; Social Relations: Supervised by office superior.

Salary; Other Benefits: In 1970, average salary for experienced keypunch operators was $112 a week.

Role of Sexes: Many women work as keypunch operators.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (61st percentile) in computation, skilled trades, farming, and labor; lowest (43rd percentile) in biological science, literary-linguistic, and social service.

Information

General: Average around 44th percentile on information scores; highest (45th percentile) in social studies; lowest (38th percentile) in vocabulary.

Abilities

General: Around the 42nd percentile on ability scores; highest (48th percentile) in creativity, mechanical reasoning, three-dimensional visualization, and introductory math; lowest (36th percentile) in English.

Specific: Table reading at 54th percentile.

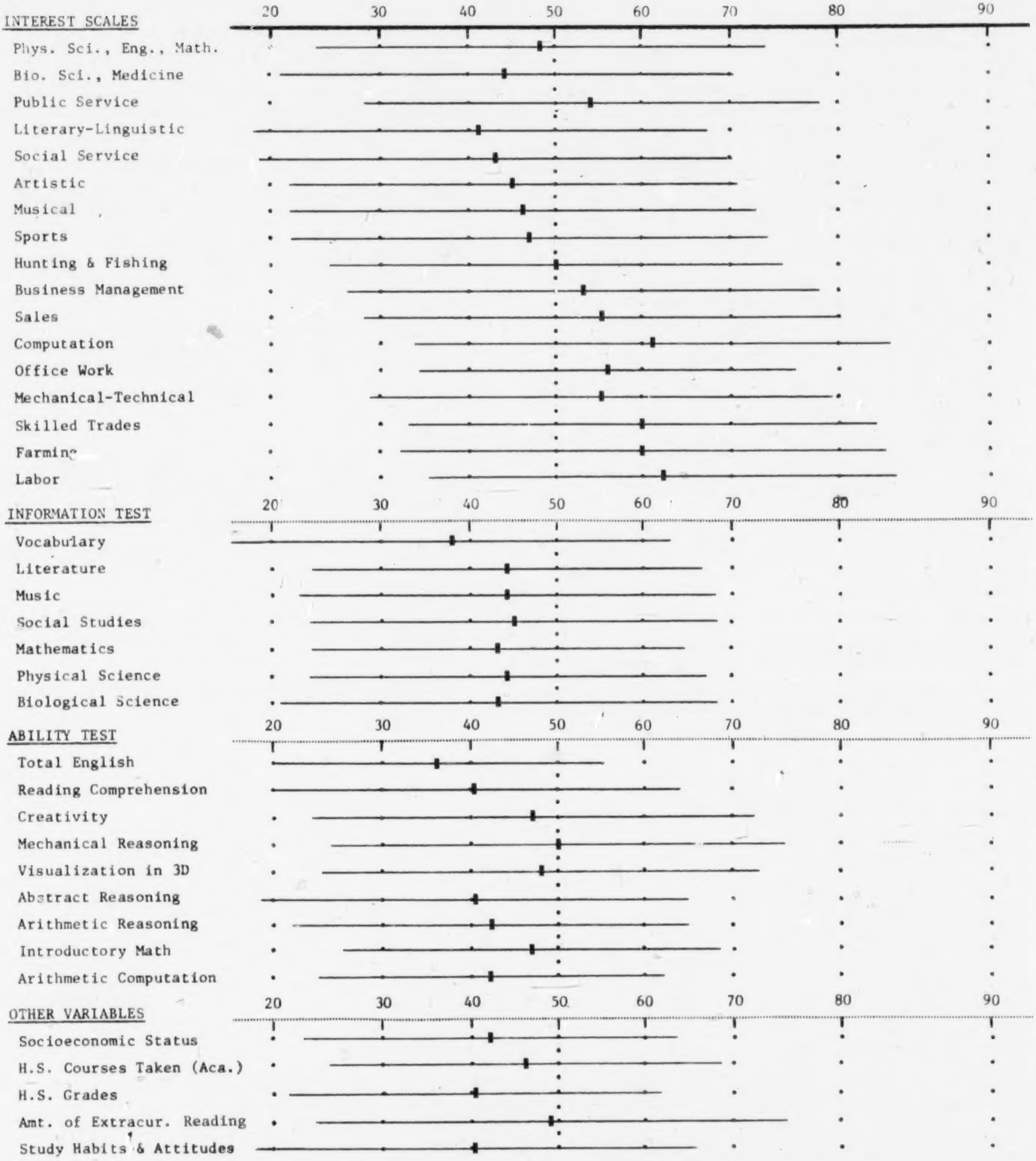
Others

General: High (49th percentile) in extracurricular reading; low (40th percentile) in high school grades, and study habits and attitudes.

Specific: 34th percentile in self-perception of reading skills.

OPERATOR - Keypunch

(Female - n = 244)



OPERATOR - Radio, Telegraph, Teletype

Importance: Rapid communication necessary in airline operation, commerce, and railroading.

Training: For airline radio operator job must have at least third-class Federal Communications Commission permit for operating radio-telephone or radio-telegraph. Must be high school graduate, have good speaking voice and weather-report vocabulary, type 40 words a minute. Teletypists must type 40 words a minute and know how to operate teletype equipment. Both radio operators and teletypists must know codes and symbols used in communication. Radio operators and teletypists start as probational workers and are given on-the-job training.

Railroad telegraphers usually work as fill-in workers until they have seniority enough for regular jobs. On most railroads should be 21-30 and high school graduates. Physical examinations required, especially for eyesight and hearing. Need dexterity and eye-hand coordination. Most are trained on the job under experienced telegraphers. Usually have to pass examinations.

Work Activities: Radio operators and teletypists are employed in air transportation to transmit weather reports and flight information to flight personnel. Radio operators use radio-telephone, teletypists transmit written messages between ground personnel by teletype machine.

Railroad telegraphers control movement of trains as directed by train dispatchers. Transmit orders from dispatchers to train crews. May also act as telephoners, signalmen, etc.

Outcomes: Correctly transmitted messages.

Supervision; Social Relations: Supervised by superior at place of employment. Team work important.

Salary; Other Benefits: Airline radio operators with minimum-level permit started at $628-$788 a month in 1970. Teletypists started at $505 a month; after 5 years up to $634. Railroad telegraphers averaged $3.58; chief telegraphers $4.00 per hour.

Role of Sexes: More women now being hired as radio operators. Most airline teletypists are women. Railroad telegraphy still a man's field.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (59th percentile) in office work; lowest (41st percentile) in natural sciences, hunting and fishing, and business management.

Information

General: Average around 49th percentile on information scores; highest (54th percentile) in literature, and music; lowest (28th percentile) in vocabulary.

Specific: 42nd percentile in electricity and electronics.

Abilities

General: Around the 36th percentile on ability scores; highest (45th percentile) in mechanical reasoning, and three-dimensional visualization; lowest (31st percentile) in abstract reasoning.

Specific: High (57th percentile) in memory for words.

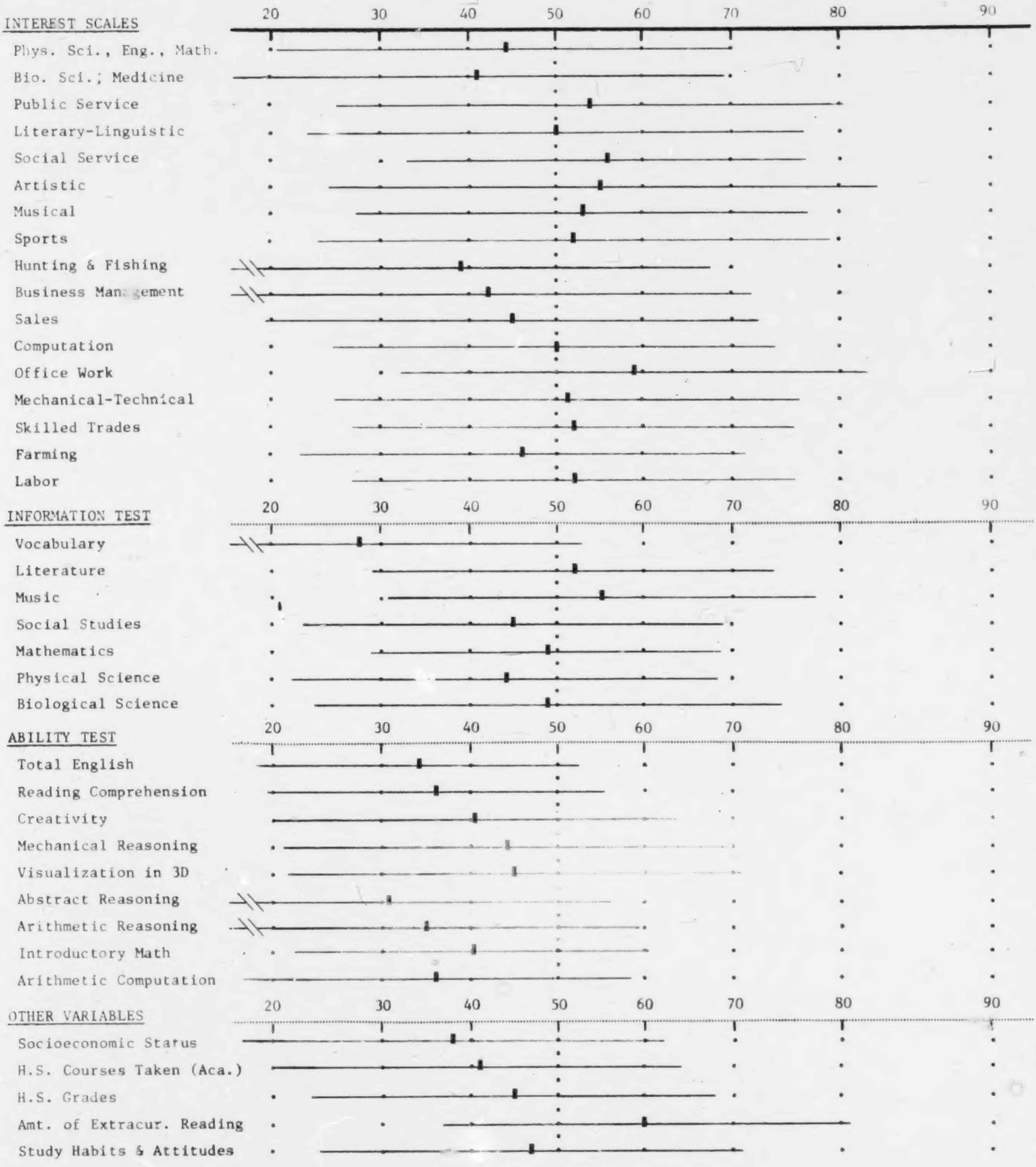
Others

General: High (60th percentile) in extracurricular reading; low (38th percentile) in socioeconomic status.

Specific: 39th percentile in sociability, and self-perception of reading skills.

OPERATOR - Radio, Telegraph, Teletype

(Male - n = 43)



OPERATOR - Telephone (PBX)

Importance: Telephone communication necessary both to business and to individuals; many calls require help of operator.

Training: Should have high school education, including English and business arithmetic. Typing desirable. Good voice, vocabulary, and memory helpful. Good hearing essential. Usually learn work by on-the-job training, either from another operator or by formal instruction provided by company.

Work Activities: Manipulates plugs, buttons, etc. to make connection. Makes long-distance calls; records costs. May provide directory assistance. PBX (private branch exchange) operators work for store, company, or other institution; may do other office work such as serving as receptionist in addition to operating telephone switchboard.

Outcomes: Telephone caller connected with desired number; costs recorded; other office duties accomplished.

Supervision; Social Relations: As company operator or as PBX operator for large organization, usually under supervisor or chief operator. As PBX operator for small office usually part of general office organization.

Salary; Other Benefits: In 1969 experienced operators in central telephone offices averaged $2.25 an hour; supervisors $3.15; chief operators $4.24. PBX operators had median earnings of $91 to $113 according to class. Night and weekend work often necessary.

Role of Sexes: Nearly all telephone operators are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (63rd percentile) in mechanical-technical, skilled trades, and labor; lowest (44th percentile) in literary-linguistic, social service, artistic, and business management.

Information

General: Average around 47th percentile on information scores; highest (52nd percentile) in physical science; lowest (44th percentile) in vocabulary, literature, and social studies.

Specific: 40th percentile in accounting, business and sales.

Abilities

General: Around the 43rd percentile on ability scores; highest (46th percentile) in mechanical reasoning, and three-dimensional visualization; lowest (31st percentile) in arithmetic computation.

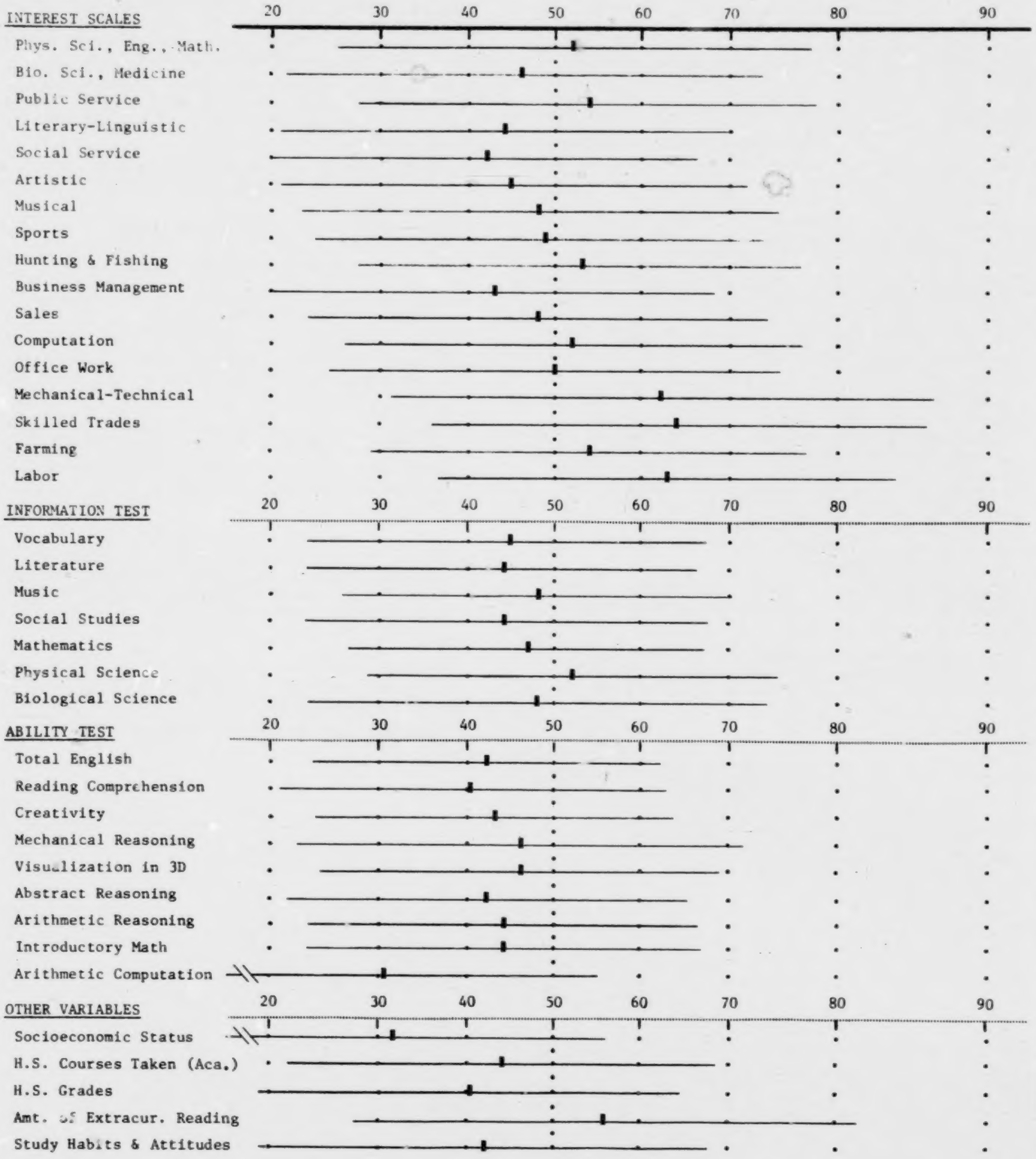
Others

General: High (56th percentile) in amount of extracurricular reading; low (32nd percentile) in socioeconomic status.

Specific: 48th percentile in sociability.

OPERATOR - Telephone (PBX)

(Female - n = 110)



RECEPTIONIST, HOTEL CLERK, etc.

Importance: Receptionist saves time of other employees by keeping out unnecessary callers and directing others to person they need to see. Hotel clerk deals directly with public and creates atmosphere of businesslike hospitality.

Training: For receptionists and hotel clerks usual requirement is high-school education, though many of them have had some college. Good English, spelling, knowledge of typing, bookkeeping, switchboard operation, business practices helpful. Should have good appearance and judgment, pleasant voice, ability to communicate, knowledge of employer's business. On-the-job training usually given informally. Correspondence courses for hotel clerks are available.

Work Activities: Receptionist greets people entering office, determines what they have come for, directs them to person they need to see. Answers inquiries; may make appointments, keep records. May also answer telephone, operate switchboard, do typing, filing, elementary bookkeeping.

Hotel clerk may be room or desk clerk, who assigns guests to rooms, sees that registration forms are filled out, and calls bellman to carry luggage. Reservation clerks make reservations and notify room clerk of them. Rack clerks keep track of which rooms are occupied and which are available for renting. In large hotels also have key clerks, mail clerks, information clerks, and floor supervisors or floor clerks. In small hotels clerk may combine various duties and also do bookkeeping, etc.

Outcomes: Visitors and guests appropriately greeted and dealt with; office tasks assigned as additional duties properly executed.

Supervision; Social Relations: Supervised by superior in office or hotel. Pleasant relationships with fellow-workers and with visitors and guests important.

Salary; Other Benefits: In 1970 receptionists in metropolitan areas earned about $92 a week. Receptionists starting work for federal government started at about $90 a week; if experienced at $100 or $110.

Wages of hotel clerks vary greatly, but according to a federal law of 1970 they are paid at least $1.60 an hour. For hotel clerks evening and weekend work is often required.

Role of Sexes: About 95% of receptionists women. A few men in medical offices, manufacturing, banking and credit offices.

Hotel clerks may be either men or women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (59th percentile) in public service, sales, skilled trades, farming, and labor; lowest (46th percentile) in office work.

Information

General: Average around 52nd percentile on information scores; highest (57th percentile) in mathematics; lowest (50th percentile) in vocabulary, physical science, and biological science.

Abilities

General: Around the 51st percentile on ability scores; highest (54th percentile) in creativity, mechanical reasoning, arithmetic reasoning, and introductory math; lowest (38th percentile) in English, and arithmetic computation.

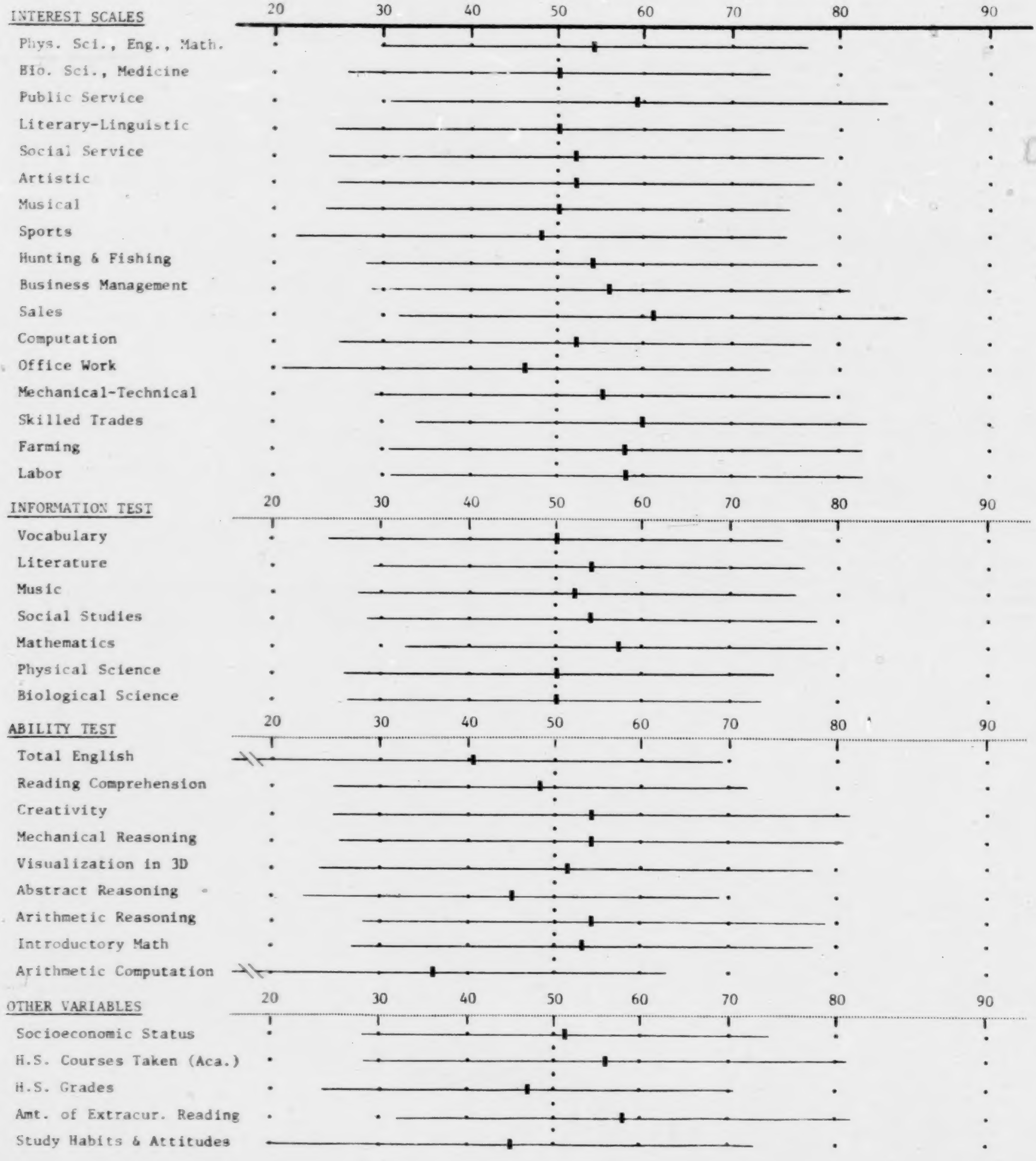
Others

General: High (58th percentile) in amount of extracurricular reading; low (45th percentile) in study habits and attitudes.

Specific: 46th percentile in sociability.

RECEPTIONIST, HOTEL CLERK, etc.

(Female - n = 142)



SECRETARY (not elsewhere classified)

Importance: Increases efficiency of employer by relieving him of some of his duties.

Training: High school education necessary. Can include secretarial skills, or these can be acquired later in trade school, secretarial college, business school, junior college or college. Knowledge of general office skills and business practices desirable. Special courses available for secretaries to doctors, lawyers, etc.

Good spelling, punctuation, grammar essential. Good personality and appearance important.

Typical Work Activities: Secretary may or may not be a stenographer as well (see p. 300) but always does typing. May write some letters independently. Relieves employer of some of his routine duties. Makes reservations, keeps track of appointments, answers telephone, often acts as receptionist (see p. 292). Secretaries to doctors and dentists schedule appointments, make out bills, keep financial records. Duties and responsibilities of secretary vary widely; some include executive duties.

Outcomes: Correspondence of office taken care of; employer assisted in routine and sometimes non-routine duties.

Supervision; Social Relations; Secretary supervised by person for whom he or she works.

Salary; Other Benefits: In 1970, secretaries to supervisors in small organizational units averaged $522 a month, secretaries to officers in small companies $582 per month, to middle management officers in large companies $625. Those with greater responsibilities averaged $679.

Role of Sexes: Most secretaries women but some men secretaries, especially in the professions, manufacturing, and public administration.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (58th percentile) in computation, office work, and skilled trades; lowest (47th percentile) in biological science, and social service.

Information

General: Average around 57th percentile on information scores; highest (58th percentile) in social studies, mathematics, and physical science; lowest (54th percentile) in biological science.

Specific: High (58th percentile) in accounting, business, sales.

Abilities

General: Around the 56th percentile on ability scores; highest (60th percentile) in English; lowest (52nd percentile) in abstract reasoning, and arithmetic computation.

Specific: 58th percentile in memory for words.

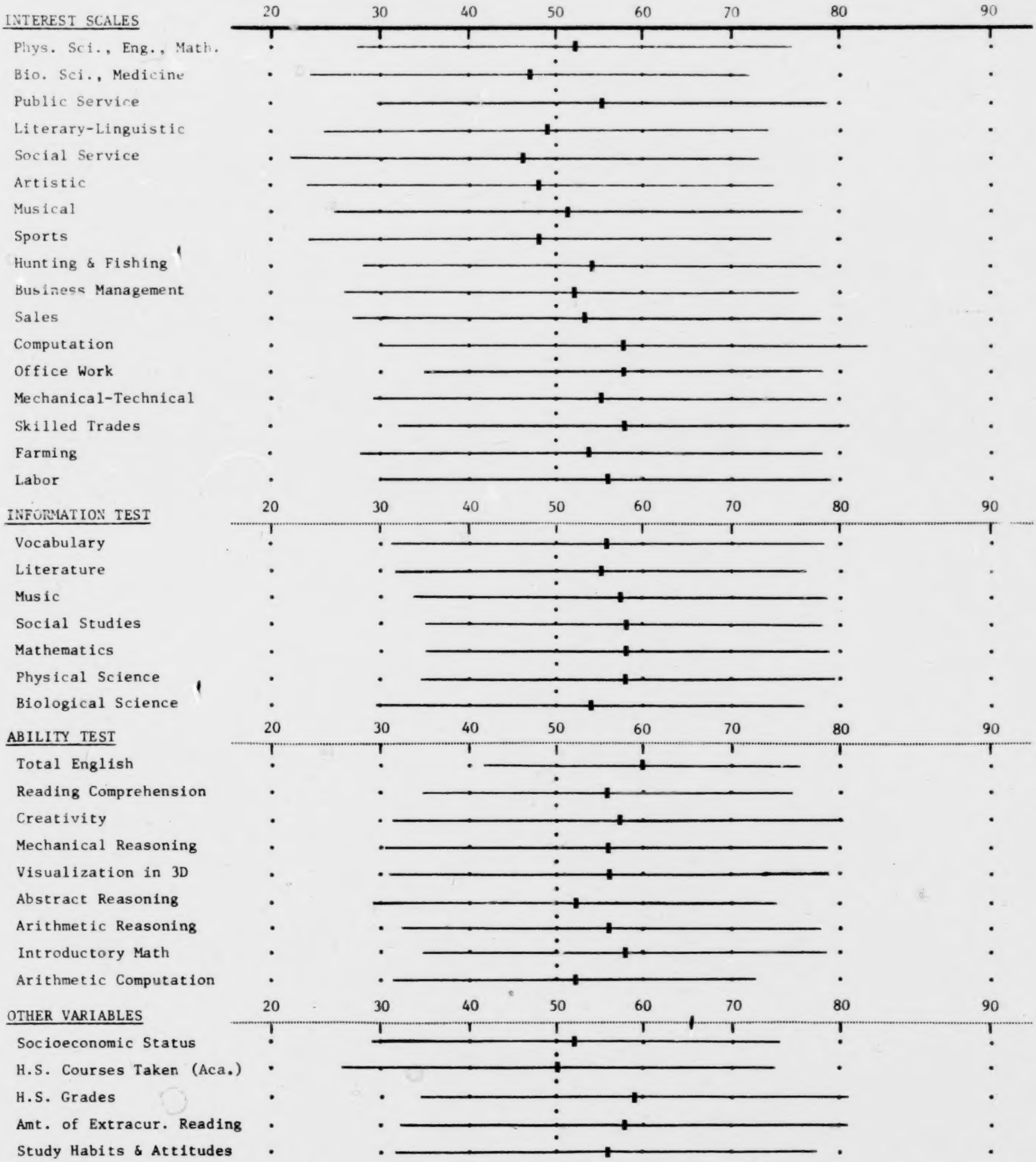
Others

General: High (59th percentile) in high school grades; low (50th percentile) in academic orientation of courses.

Specific: High (56th percentile) in self-perception of writing skills; 50th percentile in sociability, social sensitivity, and self-perception of reading skills.

SECRETARY (not elsewhere classified)

(Female - n = 2,830)



SECRETARY - Legal

Importance: Accurate instructions and records particularly essential in legal matters where serious consequences might result from errors.

Training: Same as for other secretaries (see p. 294) plus special study or courses in legal phraseology, etc. Some knowledge of legal matters very helpful.

Work Activities: Transcription of letters, records, etc. for lawyer or legal office. Often additional office duties such as filing, appointments, sending out bills, etc.

Outcomes: Correctly transcribed legal material; other office duties correctly performed.

Supervision; Social Relations: Supervised by superior in office or person served as secretary.

Salary; Other Benefits: Higher than for secretaries in general (see p. 294).

Role of Sexes: Legal secretaries may be either men or women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (58th percentile) in computation, and office work; lowest (38th percentile) in biological science.

Information

General: Average around 58th percentile on information scores; highest (64th percentile) in mathematics; lowest (54th percentile) in biological science.

Specific: High (64th percentile) in accounting, business and sales; 54th percentile in law.

Similar to: Medical/Dental Secretary

Abilities

General: Around the 58th percentile on ability scores; highest (62nd percentile) in English; lowest (53rd percentile) in abstract reasoning.

Specific: 62nd percentile in memory for words.

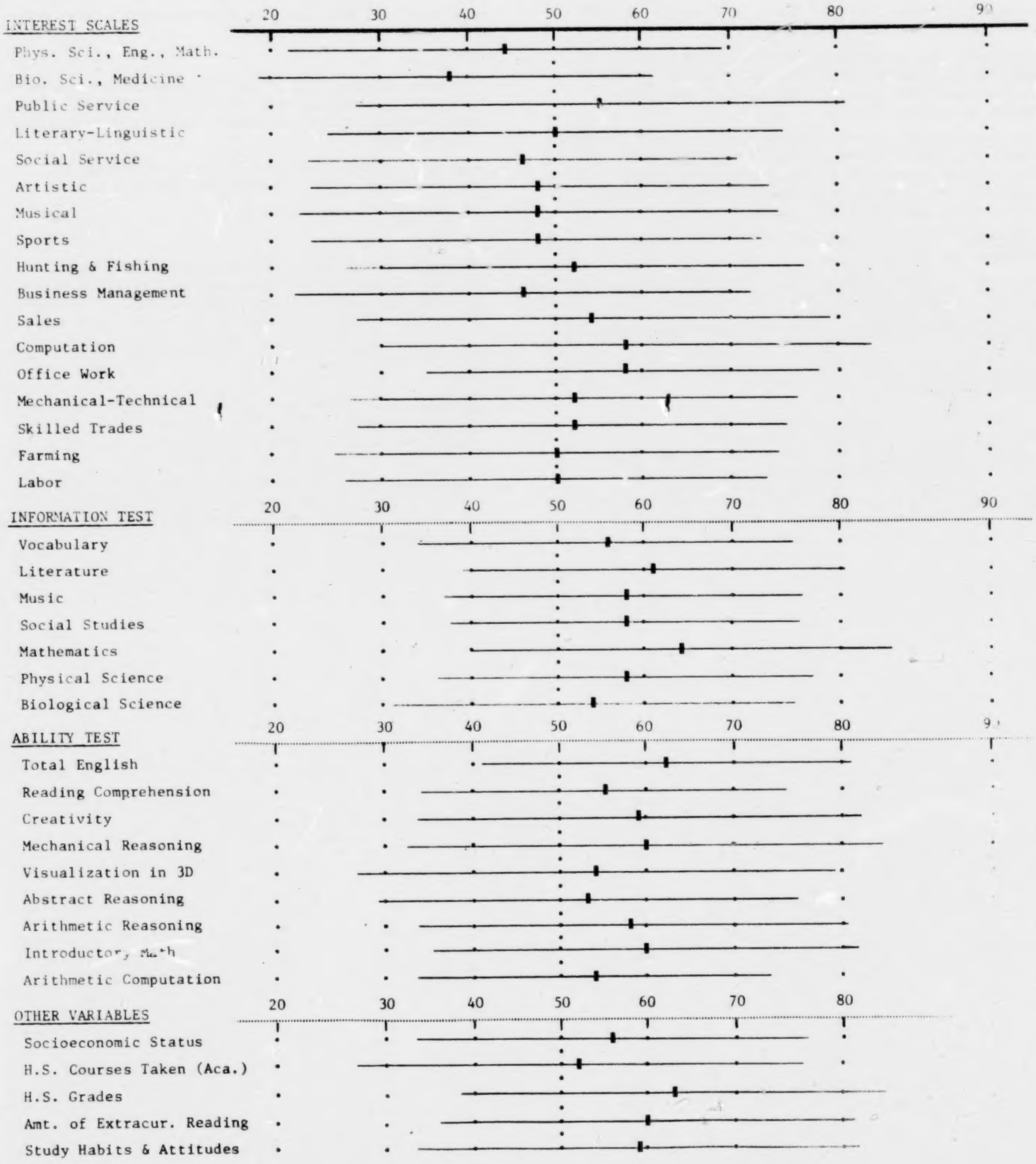
Others

General: High (63rd percentile) in high school grades; low (52nd percentile) in academic orientation of courses.

Specific: High (59th percentile) in self-perception of writing skills; 53rd percentile in sociability, and self-perception of reading skills.

SECRETARY - Legal

(Female - n = 172)



SECRETARY - Medical, Dental

Importance: Save time for doctor or dentist by taking over most of his clerical tasks.

Training: For secretarial training, see p. 294. May take special courses preparing for medical or dental secretarial work, or may learn medical and dental aspect of work on the job.

Work Activities: Greets patients, takes case histories, keeps patients' records, orders supplies, keeps income-tax records, sends out bills, makes appointments. Often combines duties of medical or dental secretary with those of medical or dental assistant.

Outcomes: Correctly kept records, accurate bills, correspondence.

Supervision; Social Relations: Usually supervised by doctor or dentist for whom she works.

Salary; Other Benefits: See section on Secretary, p. 294.

Role of Sexes: Nearly all medical and dental secretaries are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (62nd percentile) in biological science; lowest (48th percentile) in literary-linguistic, artistic, business management, sales, and office work.

Information

General: Average around 60th percentile on information scores; highest (64th percentile) in literature, and mathematics; lowest (54th percentile) in biological science.

Specific: High (62nd percentile) in accounting, business, and sales; 60th percentile in health.

Similar to: Legal Secretary

Abilities

General: Around the 54th percentile on ability scores; highest (63rd percentile) in creativity, and introductory math; lowest (50th percentile) in three-dimensional visualization, and abstract reasoning.

Specific: 56th percentile in memory for words.

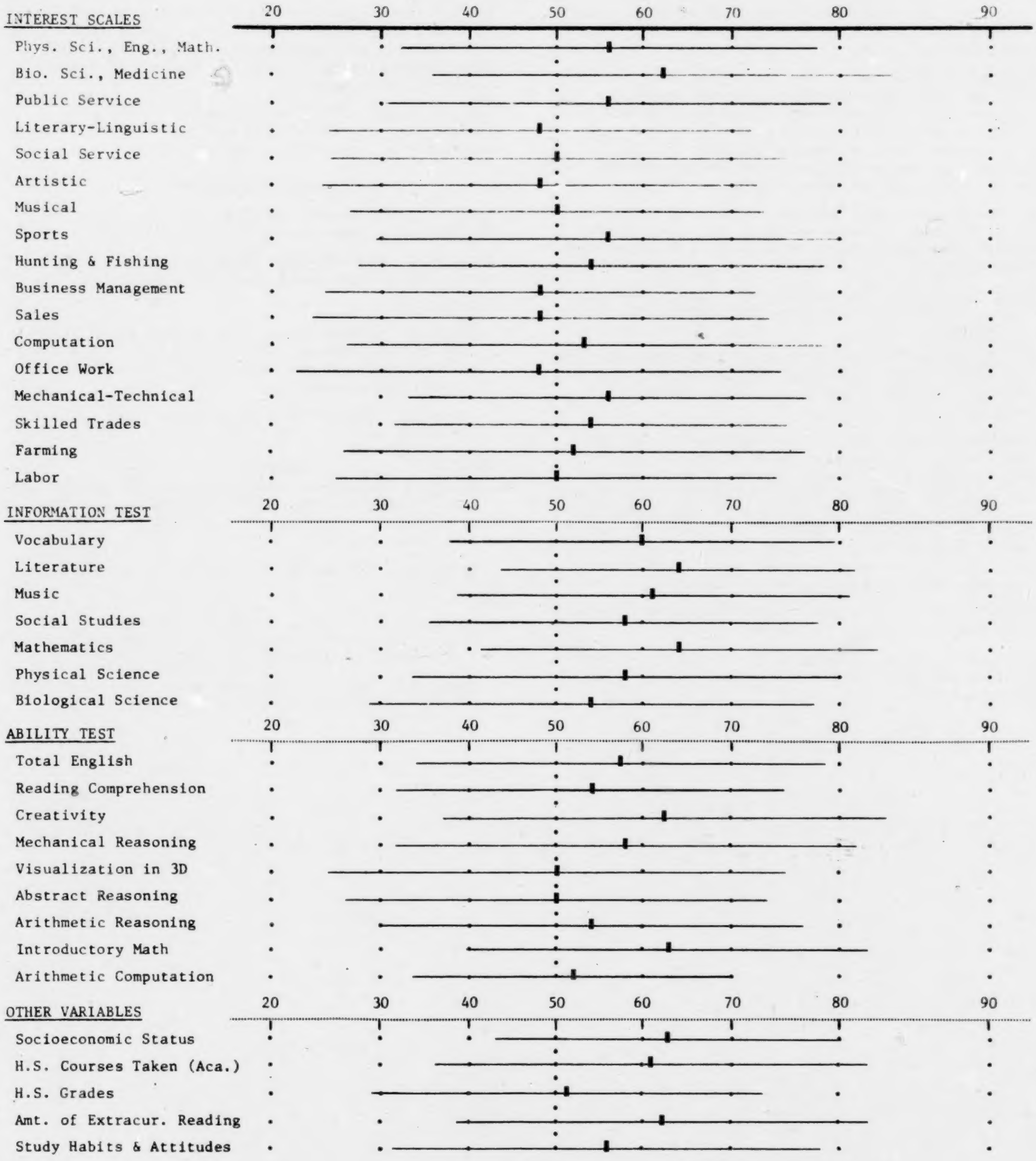
Others

General: High (62nd percentile) in socioeconomic status, academic orientation of high school courses, and amount of extracurricular reading; low (51st percentile) in high school grades.

Specific: 52nd percentile in sociability, and self-perception of writing skills; 55th percentile in social sensitivity; 50th percentile in self-perception of reading skills.

SECRETARY - Medical, Dental

(Female - n = 140)



STENOGRAPHER, etc.

Importance: Provides rapid transcription of dictated material, saves time of employer, provides record of trials, meetings, etc.

Training: High school graduation nearly always necessary. May have taken shorthand, typing, and other business subjects in high school, business school, college, or government program. Shorthand and typing can be learned in a few months but other business training also desirable. May take special courses for work in legal, medical, etc., fields.

For federal government job must be able to take dictation at 80 words a minute and type 40 words a minute. Shorthand reporting (court trials, etc.) requires much greater speed.

Stenographer needs good hearing, spelling, punctuation, grammar, vocabulary; attractive personality. Accuracy very important.

Work Activities: Takes dictation; transcribes dictation on typewriter. In reporting, transcribes what is being said. May use either paper-and-pencil shorthand or stenographic machines.

Stenographer often does general secretarial work as well. General stenographer takes dictation and does routine office tasks; senior stenographer faster and more accurate. Some senior stenographers called technical stenographers; know language of some particular field such as science. Public stenographers do short jobs for anyone wanting material typed. Court reporters transcribe what is said in court; reporting stenographers take notes at meetings, conventions, etc.

Outcomes: Correctly transcribed material; additional office duties correctly performed.

Supervision; Social Relations: Generally supervised by person for whom she does transcription or by superior in office.

Salary; Other Benefits: In 1970 in metropolitan areas general stenographers earned about $461 a month; senior and technical stenographers about $526. Beginning stenographers going to work for federal government earned $5,212 a year.

Role of Sexes: 95% of stenographers women. Men in the field largely in educational and professional services, manufacturing, government, and reporting.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (64th percentile) in office work; lowest (44th percentile) in artistic.

Information

General: Average around 52nd percentile on information scores; highest (55th percentile) in literature, mathematics, and physical science; lowest (46th percentile) in vocabulary.

Specific: 52nd percentile in accounting, business and sales.

Abilities

General: Around the 53rd percentile on ability scores; highest (58th percentile) in introductory math; lowest (50th percentile) in English, and reading comprehension.

Specific: 57th percentile in memory for words.

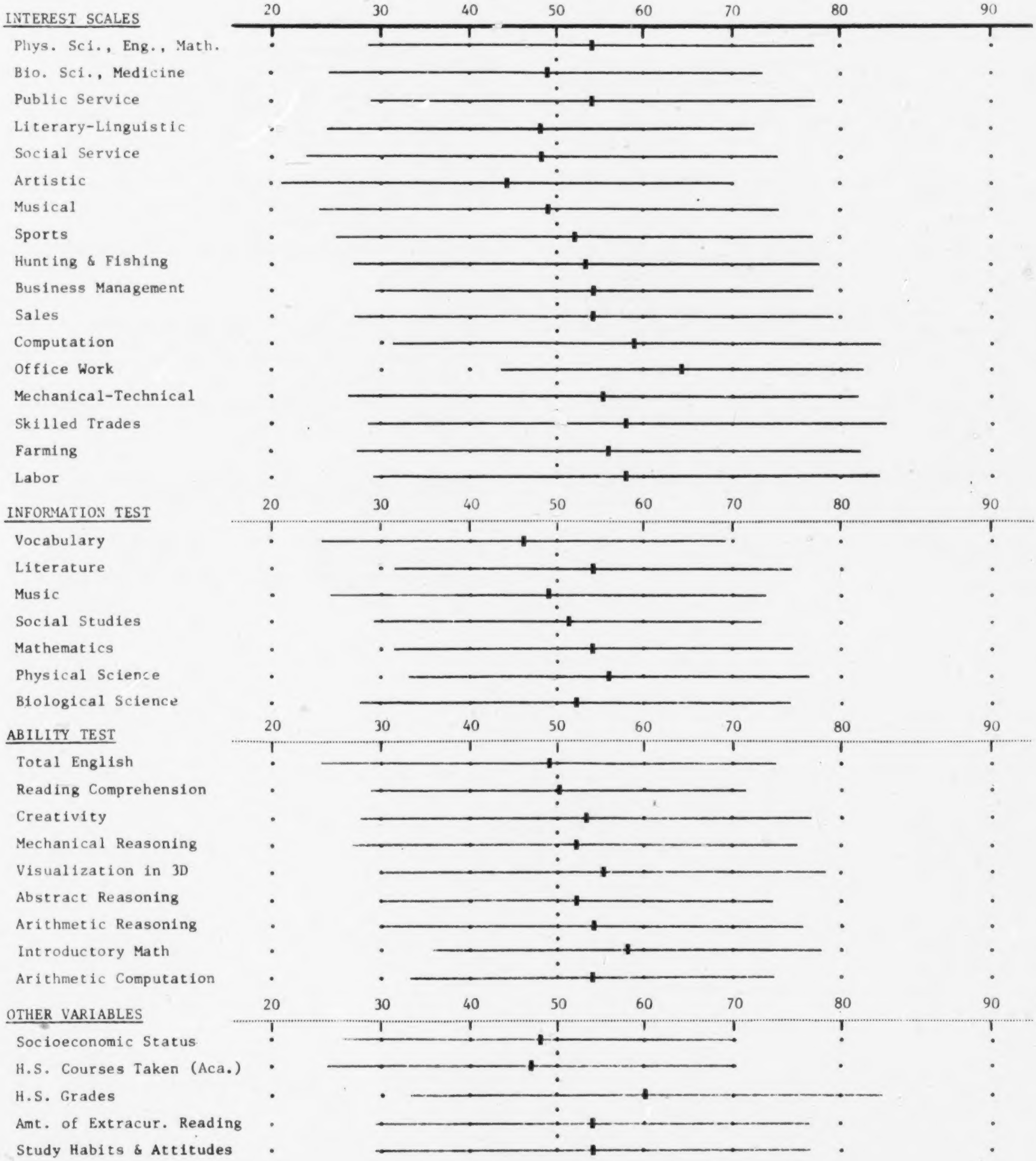
Others

General: High (60th percentile) in high school grades; low (48th percentile) in socioeconomic status, and academic orientation of courses.

Specific: 50th percentile in sociability; 54th percentile in self-perception of reading skills.

STENOGRAPHER, etc.

(Female - n = 190)



TYPIST

Importance: Legible letters an important means of communication and record in business.

Training: Most are high school graduates with typing speed of at least 40-50 words per minute. Should have good spelling, vocabulary, punctuation, grammar. Can learn typing in high school, junior college, business school, or federal programs. Business training helpful.

Work Activities: Makes typed copies of printed, handwritten, or dictated materials. Often helps with other office duties; if so may be called clerk typist. Senior typists may work from very rough material, plan and type tables, rearrange materials. Some operate teletypewriters and other special machines. Transcribing machine operators type material recorded on dictating machines. Tape perforator operators type tapes for use in computers. Policy writers type insurance policies. May be mortgage clerks, waybill clerks.

Outcomes: Correctly typed materials.

Supervision; Social Relations: May be under a head typist or office manager, or under person for whom typing is done.

Salary; Other Benefits: In 1970 beginning typists in cities averaged about $396; experienced typists $457. Beginning typists going to work for federal government started at $4,620 a year.

Role of Sexes: 95% of typists women in 1970. Some men typists in business, petroleum industry, engineering, etc.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (58th percentile) in computation, office work, skilled trades, and labor; lowest (40th percentile) in artistic.

Information

General: Average around 47th percentile on information scores; highest (50th percentile) in mathematics; lowest (42nd percentile) in vocabulary.

Specific: 46th percentile in accounting, business and sales.

Abilities

General: Around the 44th percentile on ability scores; highest (52nd percentile) in introductory math; lowest (40th percentile) in English, and abstract reasoning.

Specific: 48th percentile in accounting, business and sales.

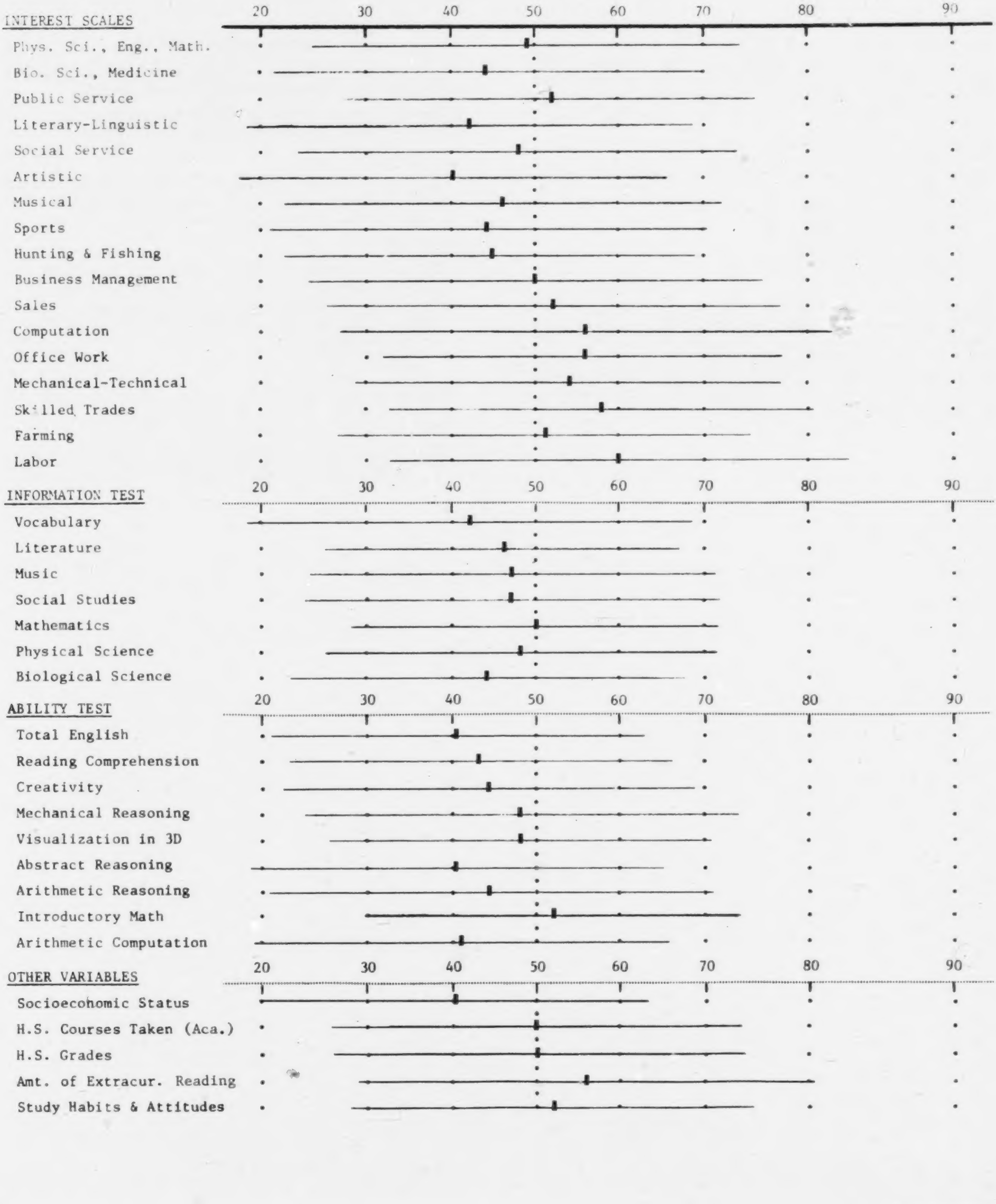
Others

General: High (56th percentile) in amount of extracurricular reading; low (40th percentile) in socioeconomic status.

Specific: 50th percentile in self-perception of reading skills; 42nd percentile in sociability; 46th percentile in self-perception of writing skills.

TYPIST

(Female - n = 290)



CHAPTER 14

CAREER GROUP 12

General Labor, Community and Public Service

All of the workers in Career Group 12 provide services to other people in the community. For example, they police our streets, put out fires, make our food and clothes, and provide health care in homes and hospitals. We have included the following jobs in Career Group 12:

Butcher, Meat Cutter (A)
Driver--Auto, Bus, Truck (B)
Farming/Ranching--Other (not elsewhere classified) (C)
Fireman (D)
Hairdresser (Females) (e)
Laborer/General (F)
Military/Enlisted (G)
Nurse/Practical (Females) (h)
Policeman (I)

The education and training requirements differ greatly among the various occupations included in this Career Group. For example, a policeman may be required to complete not only high school but also advanced training at a junior college or police academy. Other workers, such as the farmer, are not required to have completed a specific amount of education.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this Career Group had the following characteristics in high school:

Interests: Highest score (64th percentile) in skilled trades, lowest (38th percentile) in physical science.

Information

General: Average around 41st percentile on information scores; highest (44th percentile) in mathematics; lowest (37th percentile) in vocabulary.

Abilities

General: Around the 40th percentile on ability scores; highest (45th percentile) in creativity, mechanical reasoning, and three-dimensional visualization; lowest (32nd percentile) in English, and arithmetic computation.

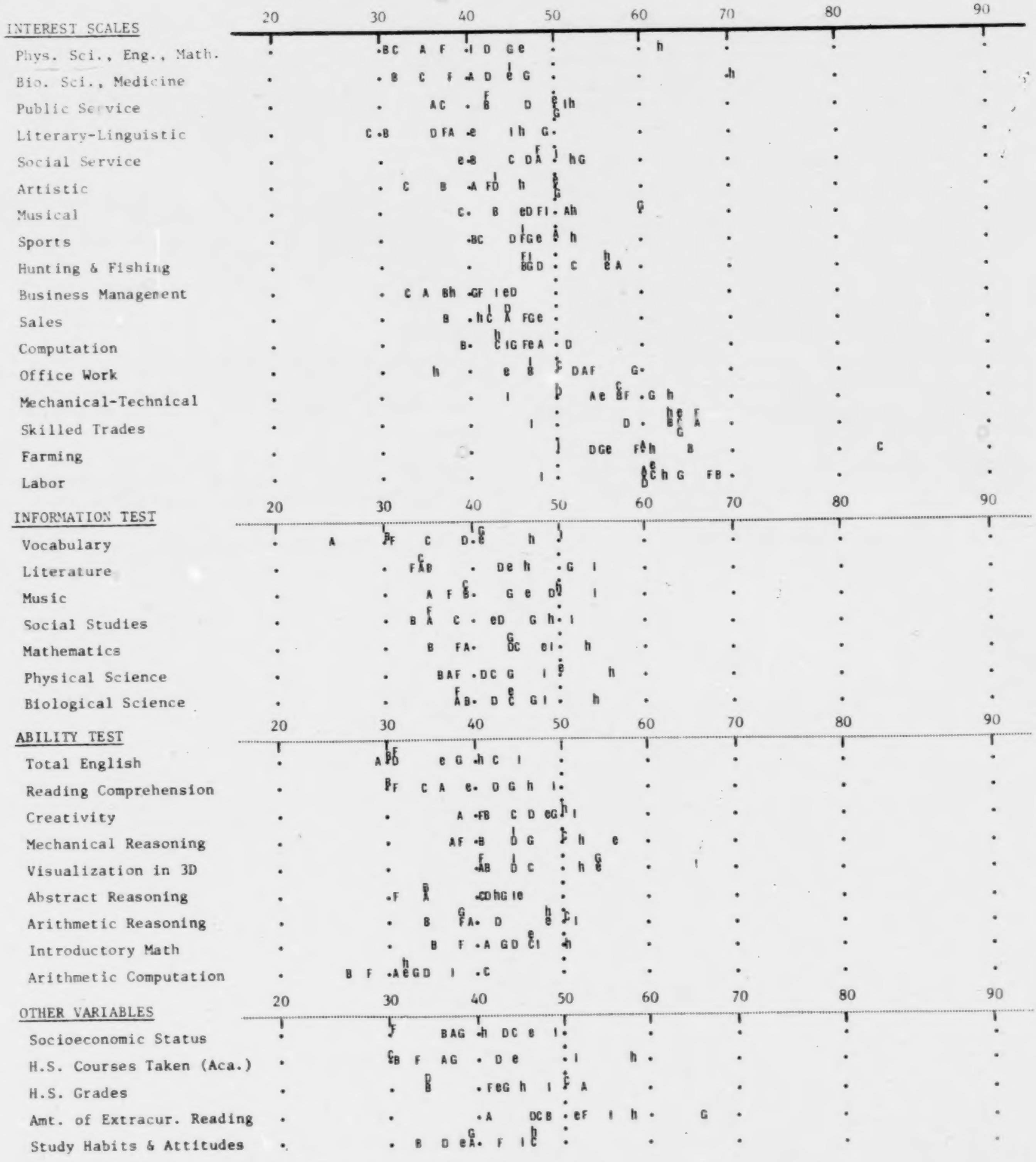
Others

General: High (51st percentile) in extracurricular reading; low (36th percentile) in academic orientation of high school courses.

Specific: High (45th percentile) in sociability; 37th percentile in self-perception of reading skills.

CAREER GROUP 12

General Labor, Community and Public Service



BUTCHER, MEAT CUTTER

Importance: More meat is consumed per capita in the United States than in most other nations. Work of butcher and meat cutter essential in its preparation.

Training: Should have high-school education and be able to use arithmetic. Physical strength needed. Health certificate may be required. Most learn by on-the-job training, but may learn by 2 or 3 year apprenticeship which includes on-the-job training and classroom work. Some vocational schools offer courses in meat cutting, as do government's Manpower programs.

Work Activities: In rural and ethnic areas butcher may kill and clean animals and birds. In most urban areas butcher is meat cutter and retailer.

Meat cutter cuts carcass into usable portions, using band saw, rotary saw, butcher knife. Slices meat, rolls and ties roasts, makes sausage. May arrange meat counter and sell to customers, or fulfill requests for meat specially cut.

Outcomes: Meats properly prepared for selling.

Supervision; Social Relations: Supervised by superior at place of employment.

Salary; Other Benefits: In 1970 union meat-cutters in large cities earned about $3.45 to $4.56 per hour. Apprentices begin at 60-70% of journeyman wages.

Role of Sexes: Largely a man's field, though a small proportion of meat cutters are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (at and above 60th percentile) in skilled trades, farming, and labor; lowest (35th percentile) in physical science, and business management.

Information

General: Average around 35th percentile on information scores; highest (38th percentile) in mathematics, physical science, and biological science; lowest (25th percentile) in vocabulary.

Specific: 37th percentile in accounting, business and sales.

Abilities

General: Around the 37th percentile on ability scores; highest (41st percentile) in three-dimensional visualization, and introductory math; lowest (30th percentile) in English, and arithmetic computation.

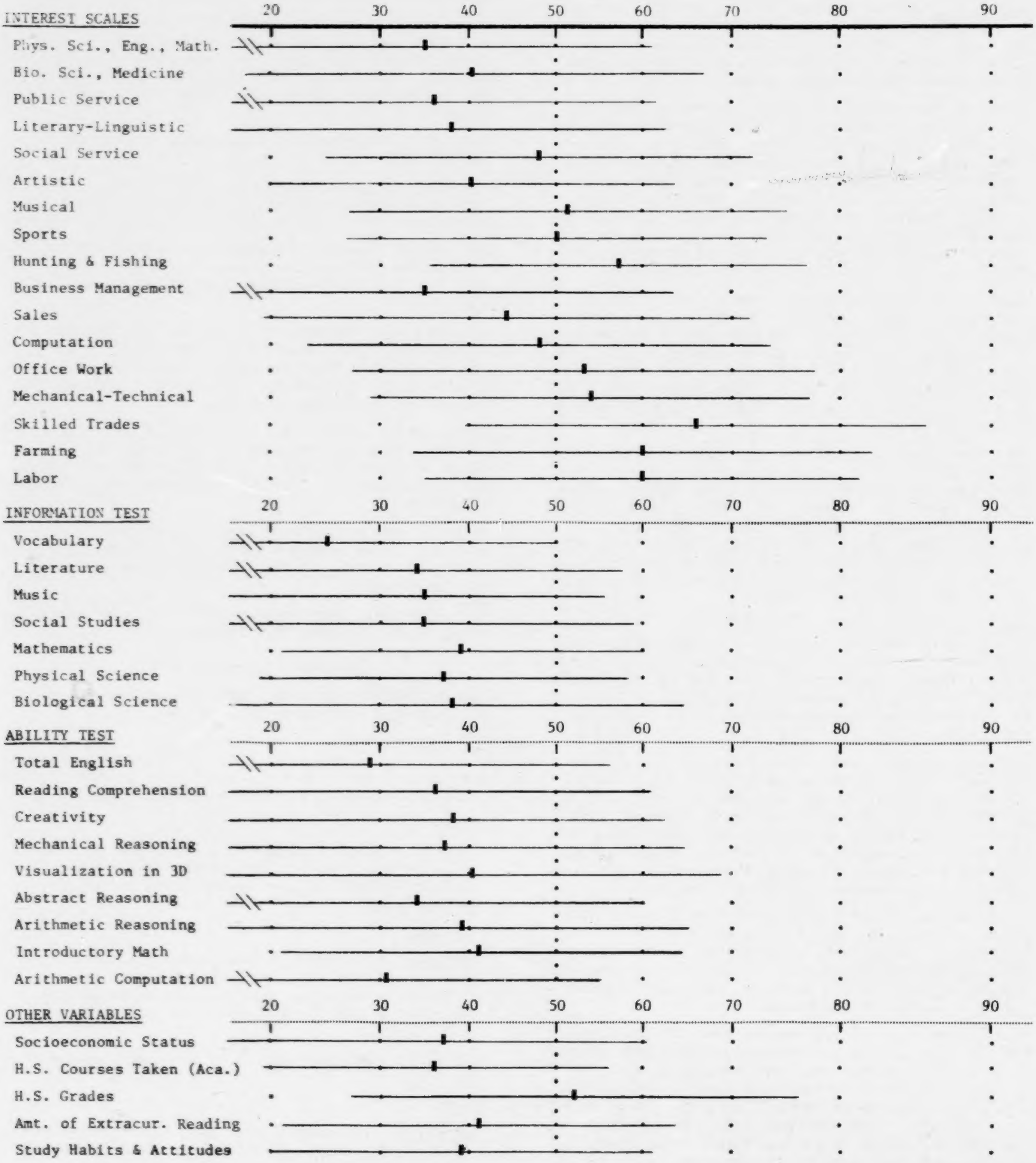
Others

General: High (52nd percentile) in high school grades; low (37th percentile) in socioeconomic status, and academic orientation of high school courses.

Specific: 46th percentile in sociability.

BUTCHER, MEAT CUTTER

(Male - n = 81)



DRIVER - Auto, Bus, Truck

Importance: Road transportation of persons and merchandise an essential element in American social and economic life.

Training: Taxi driver must have good sight and motor coordination, good driving record, no criminal record, and know city locations. Various licenses required for which he must pass examinations. Some taxi companies require eighth-grade education or more.

Intercity bus driver must meet federal age, health, and experience requirements, have one year's driving experience, good driving record, ability to read and speak English. Individual companies may have higher requirements, as high school education, passing additional tests. Most companies have their own training programs of 2 weeks to 3 months in which the trainee is given both classroom and practical instruction. Trainee then acts as assistant or substitute driver for a time, which may be several years.

Local transit bus driver must pass physical exams, have motor vehicle operator's permit and usually one or two years' experience. In most states chauffeur's license required. Local transit company usually gives training course made up of both classroom and practical work. Further examination may also be required. Acts as extra or substitute for a time. Promotion usually by examination.

Long-haul truck drivers must meet federal requirements of physical condition, eyesight, ability to read and speak English, one year's driving experience, and successful passing of written and road tests. Most companies add their own requirements regarding age, education, and experience, and may give further examinations. Professional driver training at driving or vocational school recommended. Long-haul truck driver usually begins on small trucks.

Requirements for local truckdrivers less strict. Vary according to employer and type of truck. Must have chauffeur's license, be in good health and able to do heavy lifting. Employers may give own driving examinations. Traffic and police records checked. Training by company often informal; trainee acts as assistant for a time.

Work Activities: Taxi driver takes customers to place of destination, handles luggage, sometimes works on sightseeing tours. Knows geography of city well, to be able to find address given him by customer. May get customers on street, in response to phone calls, in response to message from cab company. Keeps records of trips and fares. If owner, keeps cab clean. Most work for taxi companies; some rent cab by day.

Intercity bus driver drives buses that travel between cities, checks bus, fuel, tires, equipment before starting, takes tickets, sees to loading of baggage and packages, announces rest or lunch stops, prepares reports on trip and log of hours, may make roadside repairs. Works for bus company.

Local transit bus driver carries commuters to work and children to school. Follows definite time schedules. Usually checks bus, may check fuel, etc., before starting. Collects fares, opens door to let passengers out or on. Answers passengers' queries. Keeps records of trips made, fares received, delays in schedule. Employed by transit companies, sightseeing lines, charter companies, school bus companies.

Long-haul truck driver drives gasoline or Diesel tractor-trailer; delivers goods over long distances. May see to loading and unloading of cargo. Often does night driving, backward maneuvering of heavy trailers. Employed by private companies such as factories and supermarket chains or for-hire companies.

Local truckdriver moves goods in local area; also must be capable of accurate maneuvering of vehicle under difficult circumstances. May help with loading; usually unloads. Collects receipts and sometimes payments. May operate dump trucks or vehicles with mechanical hoists.

Outcomes: Passengers or cargo safely delivered to destination.

Supervision; Social Relations: Taxi-drivers are usually free of immediate supervision but may have occasional supervision from taxicab company. Some self-employed.

Bus drivers also free of immediate supervision but have supervision from company on basis of reports, etc. Same true for truck-drivers except those who are self-employed.

Salary; Other Benefits: Taxi driver usually gets 40-50% of fare plus tips. In 1970 many earned $2-$3 hour plus tips. Some rent cabs and keep fares, or own taxis. Often night work, work in heavy traffic, long hours. Many do not get fringe benefits.

Intercity bus driver paid by mileage. In larger intercity bus companies averaged $10,800 year in 1970. Extras (beginners) paid less when not driving. Many get health and life insurance; pensions partly financed by employer.

Local transit bus drivers usually paid by hour; in 1970 in large cities averaged $3.99 hour. Usually get life and health insurance; pension plans financed jointly with employer.

Role of Sexes: Very few women in these occupations; recently some in local bus driving.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (at and above 57th percentile) in mechanical-technical, skilled trades, farming, and labor; lowest (31st percentile) in physical science, biological science, and literary-linguistic.

Information

General: Average around 35th percentile on information scores; highest (39th percentile) in music, and biological science; lowest (30th percentile) in vocabulary.

Abilities

General: Around the 34th percentile on ability scores; highest (41st percentile) in creativity, mechanical reasoning, and three-dimensional visualization; lowest (26th percentile) in arithmetic computation.

Specific: 38th percentile in two-dimensional visualization.

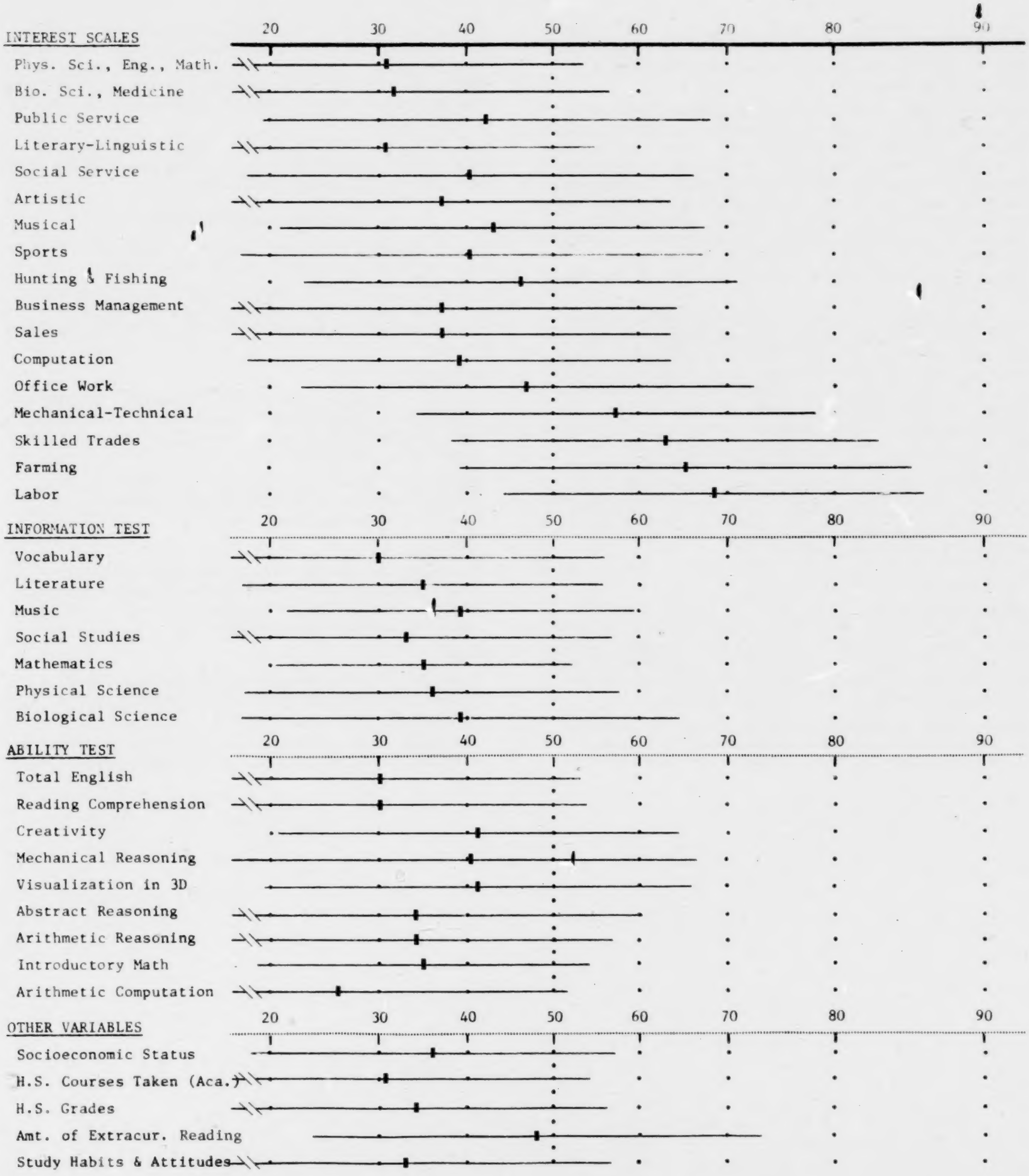
Others

General: High (48th percentile) in extracurricular reading; low (31st percentile) in academic orientation of high school courses.

Specific: 45th percentile in sociability.

DRIVER - Auto, Bus, Truck

(Male - n = 280)



FARMING, RANCHING - Other (not elsewhere classified)

Importance: Farming the most essential of all occupations. Efficient farming methods make it possible for most of the population to work in industry and in service activities.

Training: Most farmers acquire knowledge informally by growing up on a farm or by working for established farmers. Can also get high school courses in agriculture, short courses given for farmers by agricultural schools, or evening courses for farmers. County agricultural agent gives advice and assistance. With some new farming methods, such as raising chickens and turkeys by the battery system, instructions and advice are given by the company financing the operation. Amount of training needed depends on type of farming being done.

Work Activities: Farmer, on farm devoted to raising crops, prepares soil, provides fertilizer, plants, controls weeds and pests, harvests his crop. In cattle ranching uses existing grazing land, cares for cattle. On traditional family farm raises both crops and livestock. On new-type farms, farm may have only two or three products. Farmer must now keep extensive records of costs, both for government and to determine most efficient procedures. Considerable planning needed. Most farmers need to know enough about machinery to service and sometimes repair their farm equipment, and enough about animals to care for them in health and sickness. If hired by owner, duties may be general or, on large farm, specialized.

Outcomes: Salable farm products.

Supervision; Social Relations: If renting farm and farming it himself, may have no supervision. If farming on shares with owner will probably be supervised by owner. If hired by owner, for wages, probably close supervision. On family farm, close social relations with family, members of whom work with him.

Salary; Other Benefits: Farm income varies according to crops, prices, and government subsidies. Larger farms needed now to support family than was formerly the case. In evaluating farm income prospective farmer should remember that income results in part from unpaid labor by farmer's family. For independent farmer no paid vacation, insurance, or fringe benefits, but farmer usually has housing and part of food supply in addition to cash income.

Role of Sexes: Farmer nearly always a man but some wives assist substantially with farm work. Among migratory laborers, many of workers women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Very high (83rd percentile) in farming; high (61st percentile) in mechanical-technical, skilled trades, and labor; lowest (29th percentile) in literary-linguistic.

Information

General: Average around 39th percentile on information scores; highest (45th percentile) in mathematics, and biological science; lowest (35th percentile) in vocabulary, and literature.

Specific: Very high (75th percentile) in farming; 50th percentile in mechanics; 41st percentile in health, and outdoor activities.

Abilities

General: Around the 44th percentile on ability scores; highest (50th percentile) in mechanical reasoning, and arithmetic reasoning; lowest (34th percentile) in reading comprehension.

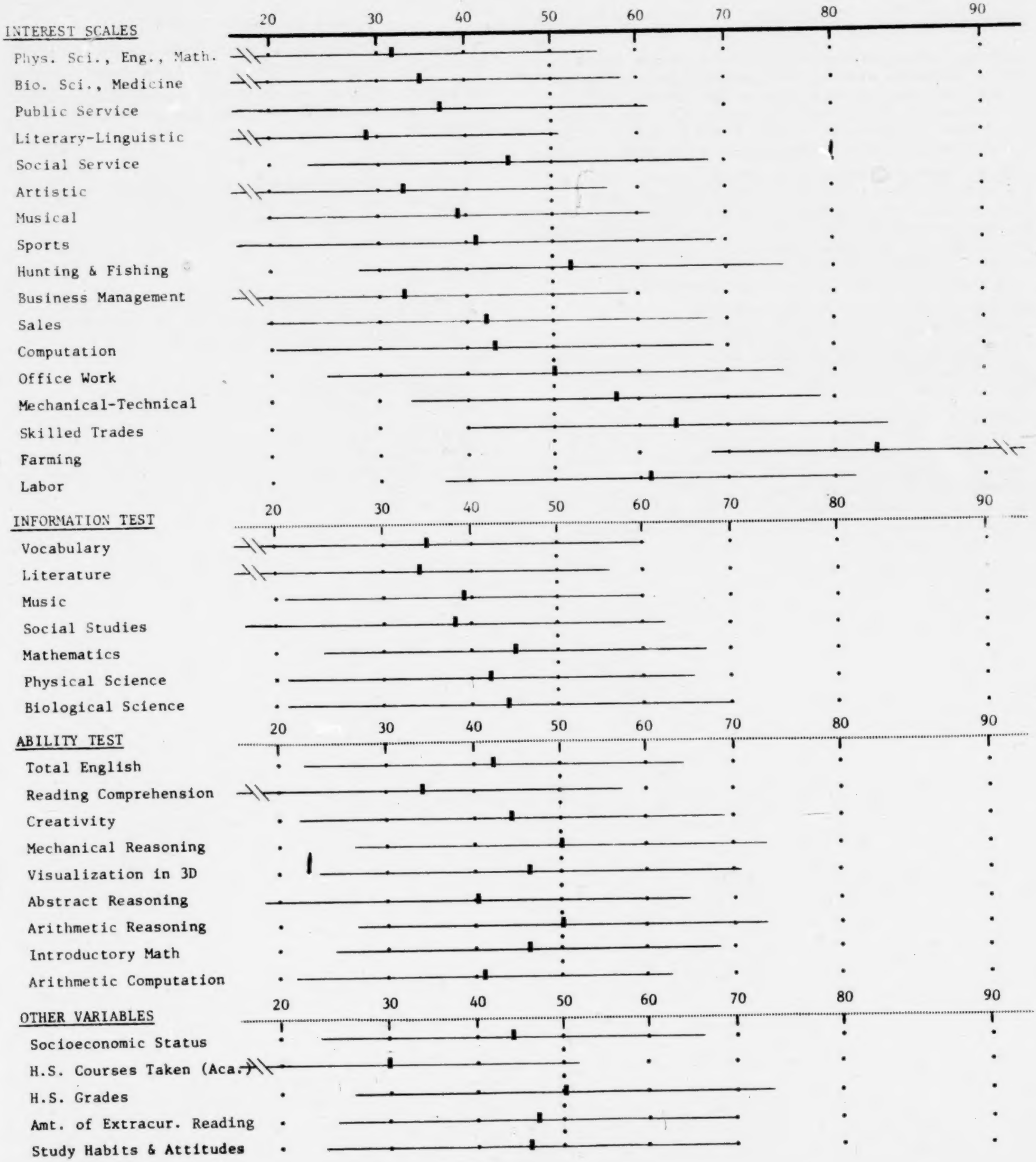
Others

General: High (50th percentile) in high school grades; low (30th percentile) in academic orientation of courses.

Specific: 42nd percentile in sociability; 39th percentile in self-perception of reading skills.

FARMING, RANCHING - Other (not elsewhere classified)

(Male - n = 683)



FIREMAN

Importance: Fire prevention and control necessary both for human safety and to avoid property loss.

Training: Must usually be 21, pass tests of intelligence, strength, stamina, and agility, meet height and weight requirements, have high school education. Appointment by civil service regulations. Training given after appointment, and throughout career. Some already have training as volunteers or in armed forces.

Work Activities: Maintain equipment, inspect public and some private buildings for fire hazards. Must be able to carry on many kinds of fire-fighting activities. Put out fires or prevent them from spreading; get people out of burning buildings, give first aid. Sometimes assist citizens in emergencies such as drowning, heart attack. Educate public about fire prevention.

Outcomes: Preventing and extinguishing of fires; safety of people in burning buildings.

Supervision; Social Relations: Supervised by superiors in fire department. Teamwork and organization necessary.

Salary; Other Benefits: In large cities in 1970 started at about $7,800 a year; in small cities about $6,100. If experienced averaged about $9,200 a year in large cities; in others over $7,000. Fire chiefs averaged $21,600 in large cities; $9,600 in smaller cities. Work week about 56 hours but not all of this spent in work. Excellent pension, retirement, sick leave benefits.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (59th percentile) in skilled trades, and labor; lowest (36th percentile) in literary-linguistic.

Information

General: Average around 43rd percentile on information scores; highest (49th percentile) in music; lowest (39th percentile) in vocabulary.

Specific: 41st percentile in health.

Abilities

General: Around the 42nd percentile on ability scores; highest (46th percentile) in creativity; lowest (31st percentile) in English.

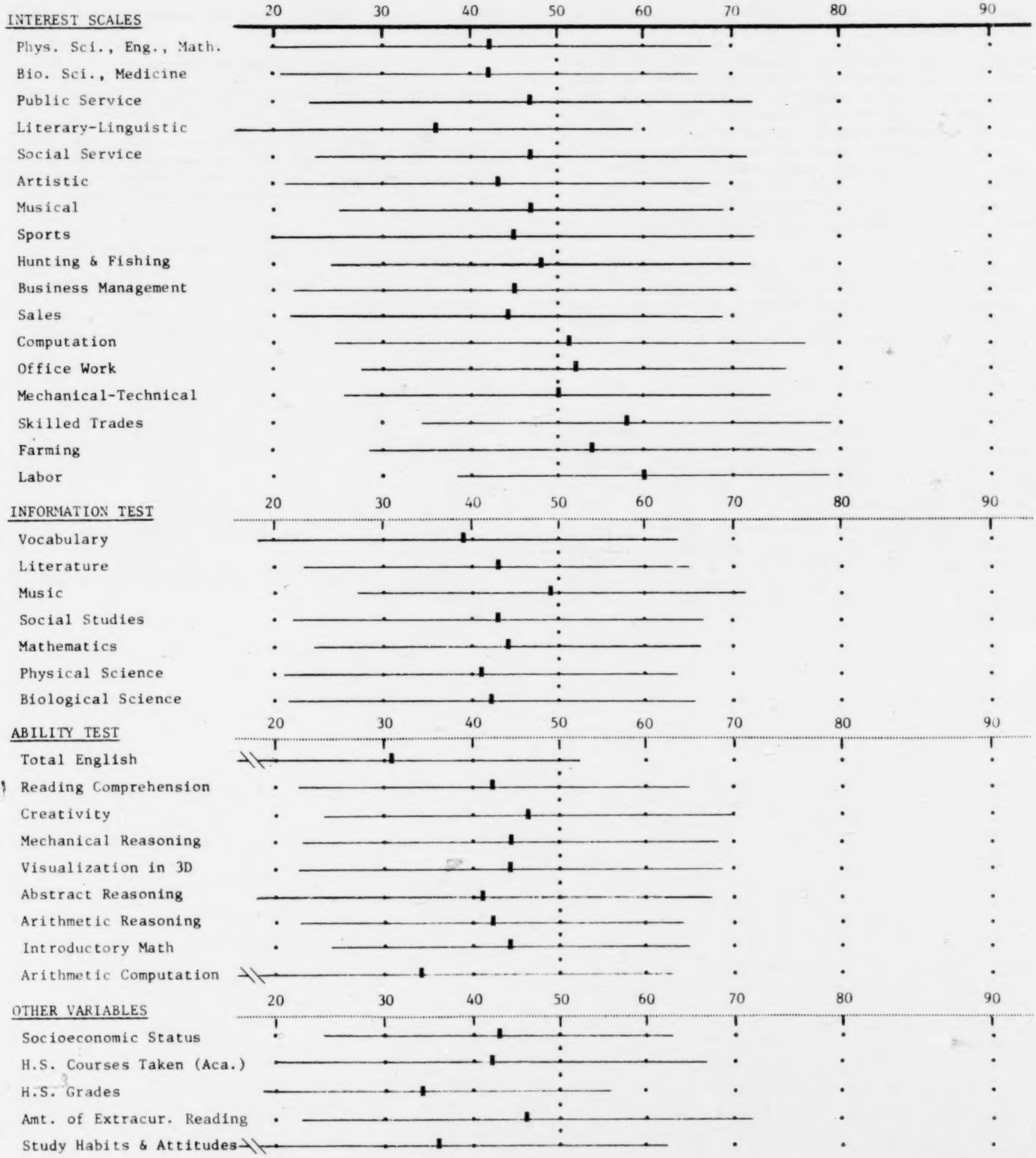
Others

General: High (46th percentile) in extracurricular reading; low (34th percentile) in high school grades.

Specific: High (50th percentile) in sociability; 37th percentile in self-perception of reading skills; 44th percentile in social sensitivity, self-confidence, and maturity.

FIREMAN

(Male - n = 143)



HAIRDRESSER

Importance: Contributes to customer's appearance and sense of well-being.

Training: Must have state license, given by examination. Usually must be at least 16, in good health, and have completed at least 10th grade. (Requirements vary according to state.) Must have completed either state-approved cosmetology course or period of apprenticeship. Training can be gotten from vocational school or trade school; usually about 6-12 months. Apprenticeship training 1-2 years. Cosmetologist's training includes both classroom and practical work. Fewer hours of training required for manicurist's license.

Work Activities: Cut, wash, straighten, wave, dye hair. Trim, file, polish nails. Pluck eyebrows. Clean and style wigs. Give scalp treatments and facials. Advise on beauty problems. Clean and sanitize instruments. May specialize in some special activity such as hair dyeing.

Outcomes: Improved appearance of patrons.

Supervision; Social Relations: Over half of beauty salons operated by owner; in this case, no supervision except indirectly from customers. If cosmetologist is not owner, is supervised by owner of shop or in large salons by superior in department. Good personal relations with customers necessary.

Salary; Other Benefits: Beginner may make $65-$90 week. Top specialists may get $300 week. Income may include tips. Late afternoon and Saturday work often necessary. Many part-time jobs available. In some places get paid vacation, insurance, etc.; none if self-employed.

Role of Sexes: Many men work as cosmetologists and hairdressers.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (63rd percentile) in skilled trades, and labor; high (56th percentile) in hunting and fishing, mechanical-technical, and farming; lowest (40th percentile) in literary-linguistic, and social service.

Information

General: Average around 44th percentile on information scores; highest (50th percentile) in physical science; lowest (42nd percentile) in vocabulary, and social studies.

Specific: 45th percentile in accounting, business and sales.

Abilities

General: Around the 46th percentile on ability scores; highest (56th percentile) in mechanical reasoning; lowest (32nd percentile) in arithmetic computation.

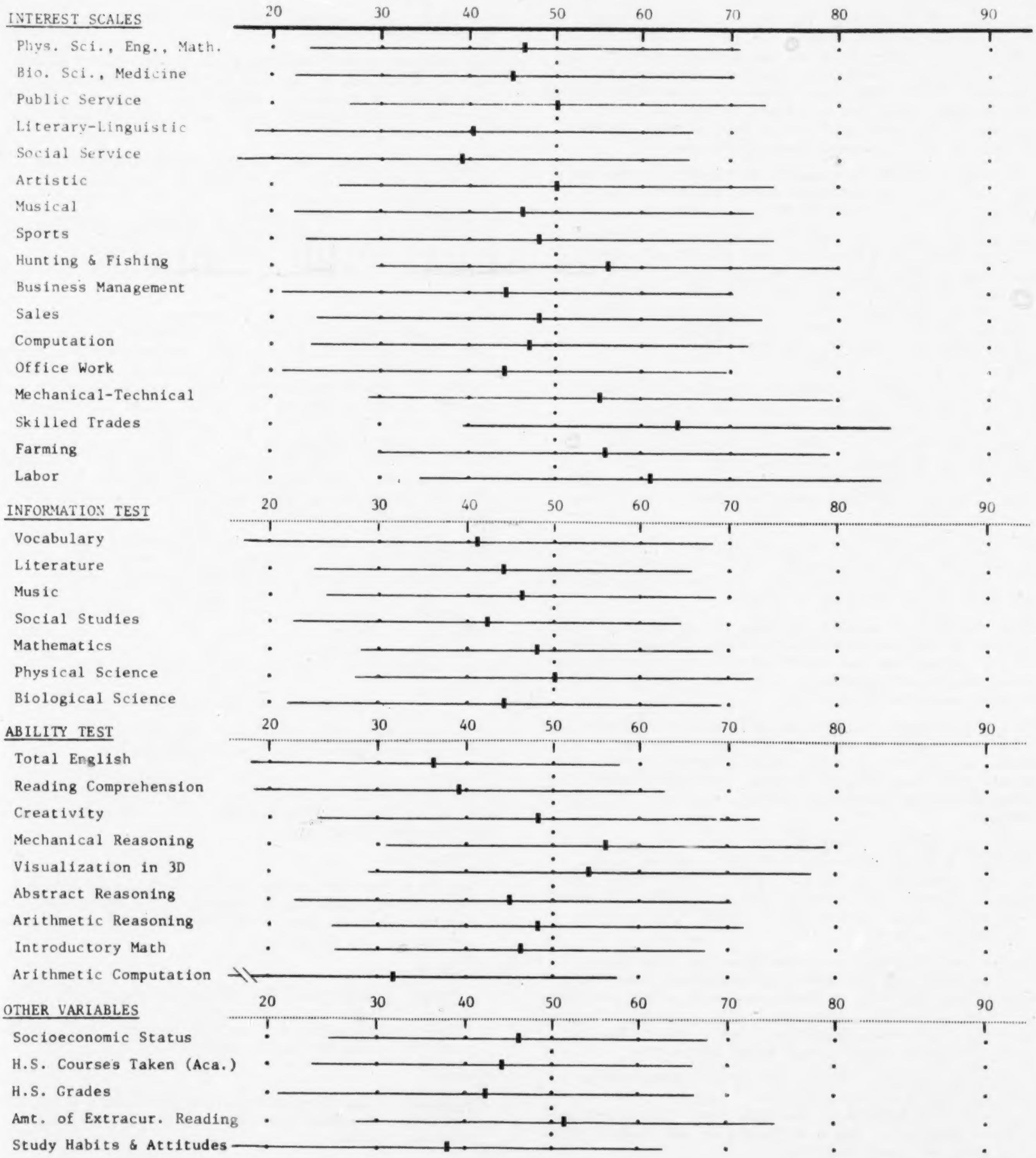
Others

General: High (51st percentile) in extracurricular reading; low (38th percentile) in study habits and attitudes.

Specific: 47th percentile in sociability, and social sensitivity.

HAIRDRESSER

(Female - n = 719)



LABORER - General

Importance: Many jobs that require willingness to work rather than specialized training are essential in our economic system.

Training: In these jobs training is usually given after the employee is hired, and in most cases takes only a short time. Examples are factory assembly-line worker, waiter or waitress, janitor, baggage fork lift operator, short order cook. Some of these require only simple skills that can be taught on the job; others draw on skills that most people have already acquired as part of their general life experience.

A factory assembly-line worker is taught his task on the job. For some precision work, additional skills, such as ability to read blueprints, necessary.

Waiters and waitresses may learn on the job but courses in this skill are offered by some vocational schools and trade schools and under the government's Manpower Development program. Many employers want waiters and waitresses with some high school education. Need to be able to add up checks correctly. Health certificates required in some states. In expensive restaurants more training required.

Janitors or building custodians require more training now than formerly because of the use of cleaning machines and chemicals which might be dangerous if improperly used. No educational requirements, but reading and arithmetic essential; shop courses useful. Usually learn skills on the job, beginning with simpler tasks. In some cities courses provided by unions or government.

Fork lift operators may be given physical examinations. Should have good eyesight and depth perception, mechanical ability. Usually learn on the job; large companies may have formal training programs.

Short order cook usually acquires skills on job while working as kitchen helper but cooking courses are available at vocational and trade schools and under the Manpower Development program. Many states require cooks to have health certificates.

Work Activities: Factory assembly-line worker may have a task as simple as screwing one particular nut into place, or may put several pieces together to make part or all of a manufactured object. Work monotonous and often demanding because a certain speed must be maintained.

Waiter or waitress takes customers' orders, brings food and drinks, makes out bill and computes taxes. In small restaurants may set up and clear tables, prepare sandwiches, or serve at cashier's desk. In expensive restaurants, may advise on wines, make salads, cook dishes requiring flame.

Janitor or building custodian keeps building clean, sees that heating and ventilation systems function, makes minor repairs, exterminates pests. May use power cleaning apparatus. Determines what cleaning compounds are safe for various purposes. Makes minor plumbing and electrical repairs; does minor carpentry.

Fork lift operator drives power truck; moves heavy objects from place to place in factory, station, or business establishment. Operates fork lift, loads and unloads materials, may keep record of materials moved, keep truck in good condition.

Short order cook prepares foods ordered by customer, usually from limited list. In small restaurant such as diner also waits on counter, prepares place settings, removes used dishes and cleans counter. May purchase food supplies.

Outcomes: Task accomplished to satisfaction of worker, supervisor, or customer.

Supervision; Social Relations: Factory assembly-line worker supervised by foreman, waiter or waitress by head waiter or restaurant owner; janitor by building owner or superintendent, short order cook by head cook or restaurant owner.

Salary; Other Benefits: Assembly-line workers' pay dependent on kind and location of job and degree of unionization. In early 1969, motor vehicle assemblers averaged $3.60 an hour, while assemblers of motor vehicle parts and accessories averaged $3.03. In 1970, assemblers working under union contracts earned from $2.15 to $3.75 an hour. Some assemblers paid piecework rates.

Waiter or waitress working in several large cities under union contract in 1970 earned $0.82 to $2.15 an hour, plus tips and often meals. Others probably earned less. Male building custodians in metropolitan areas, caring for manufacturing buildings, earned $2.80 an hour in 1969-70; those caring for retail trade buildings $2.15 A fork lift operator working in manufacturing in metropolitan areas averaged about $3.27 an hour in 1969-70. Unionized cooks in 1970 averaged $2.02 to $4.12 an hour, and assistant cooks from $1.47 to $3.86, but the wages of short-order cooks, many of whom work in small low-priced places, are probably less.

Role of Sexes: Number of women employed as assemblers differs according to industry; more women assemble light parts. About 50% of assemblers were women, about 90% of waiters and waitresses women, about 25% of building custodians women in 1970. Fork lift operators nearly always men. About 60% of cooks and chefs women. In restaurants, about half of cooks women, and great majority of cooks in schools and hospitals.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (at and above 58th percentile) in mechanical-technical, skilled trades, farming, and labor; lowest (37th percentile) in natural sciences, and literary-linguistic.

Information

General: Average around 37th percentile on information scores; highest (38th percentile) in mathematics, physical science, and biological science; lowest (31st percentile) in vocabulary.

Abilities

General: Around the 38th percentile on ability scores; highest (40th percentile) in creativity, and three-dimensional visualization; lowest (28th percentile) in arithmetic computation.

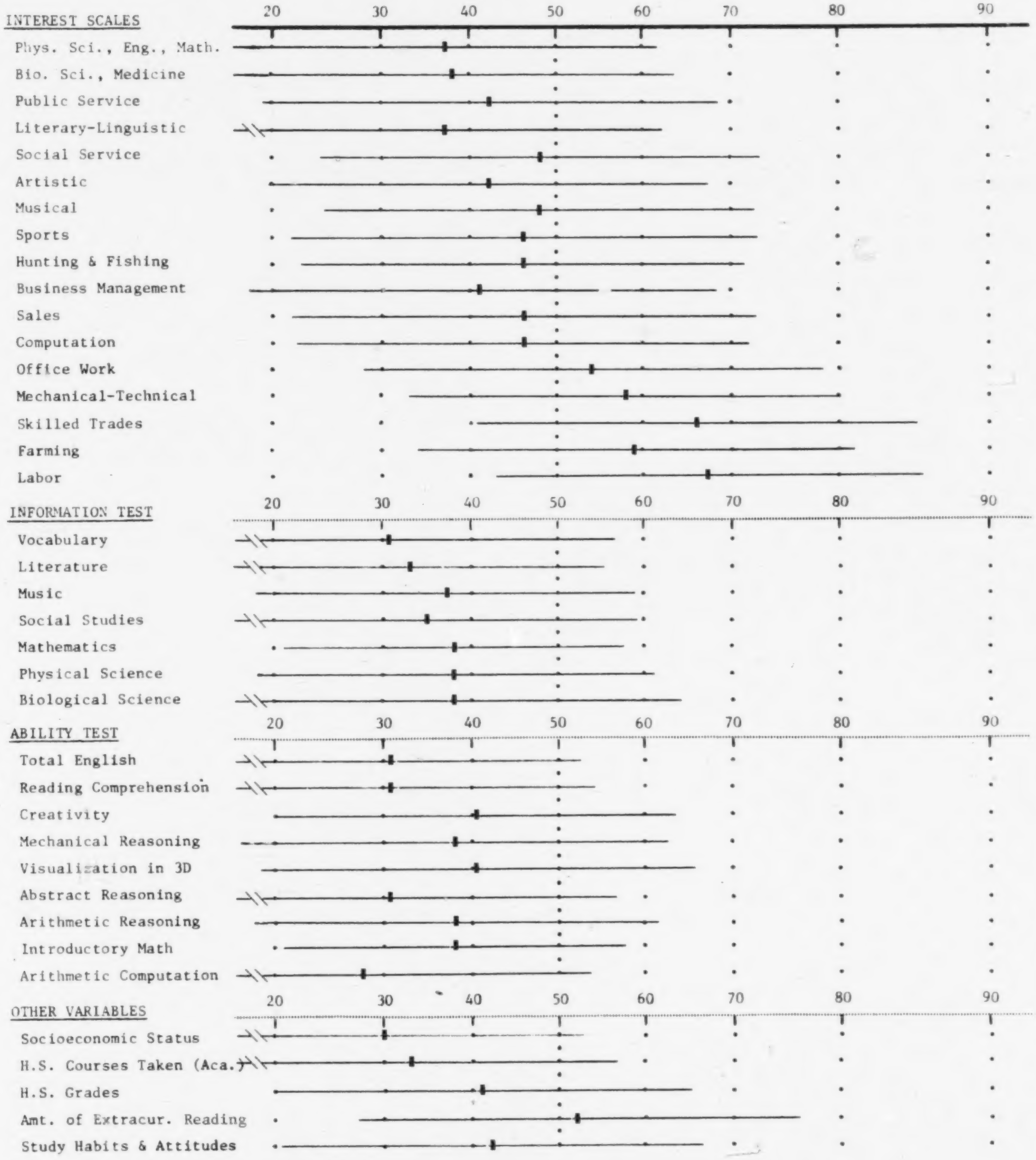
Others

General: High (54th percentile) in amount of extracurricular reading; low (30th percentile) in socioeconomic status.

Specific: 46th percentile in sociability.

LABORER - General

(Male - n = 927)



MILITARY - Enlisted

Importance: Efficient armed services necessary for safety of country.

Training: Must pass physical and mental tests for entrance. All training given after entrance. Receive general ("basic") training, plus additional training in specialties needed by armed forces. Under certain circumstances serviceman may choose specialty for which he is trained. Many scientific and technical specialties available. May be trained on the job or in service school. Education in academic subjects also available to servicemen.

Work Activities: In addition to combat and related activities such as tank-driving, armed forces have many occupations similar to those in civilian life. Serviceman may cook, keep records, act as physician's assistant, be electrician, photographer, carpenter, truckdriver, laboratory assistant, stenographer, translator, airplane mechanic, telegrapher, radar operator, metal worker, teacher, or engage in many other military occupations.

Outcomes: Successful completion of tasks assigned.

Supervision; Social Relations: Supervised by persons directly above him in the chain of command and at work.

Salary; Other Benefits: Salaries in 1973 are as follows: Recruits now begin at $307 per month. Sergeants earn $384 per month, which may rise to $507 with additional promotion. This is in addition to many fringe benefits.

Fringe benefits excellent. Allowances are made for support of dependents, housing often provided, medical care to serviceman and dependents free. One month's paid vacation per year. Retirement possible after twenty years.

Role of Sexes: Women eligible for all of the armed services.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (62nd percentile) in musical, office work, mechanical-technical, skilled trades, and labor; lowest (40th percentile) in business management.

Information

General: Average around 44th percentile on information scores; highest (51st percentile) in literature; lowest (41st percentile) in vocabulary.

Specific: 53rd percentile in aerospace, and military; 46th percentile in mechanics, and foreign travel; 50th percentile in accounting, business and sales.

Abilities

General: Around the 43rd percentile on ability scores; highest (54th percentile) in three-dimensional visualization; lowest (33rd percentile) in arithmetic computation.

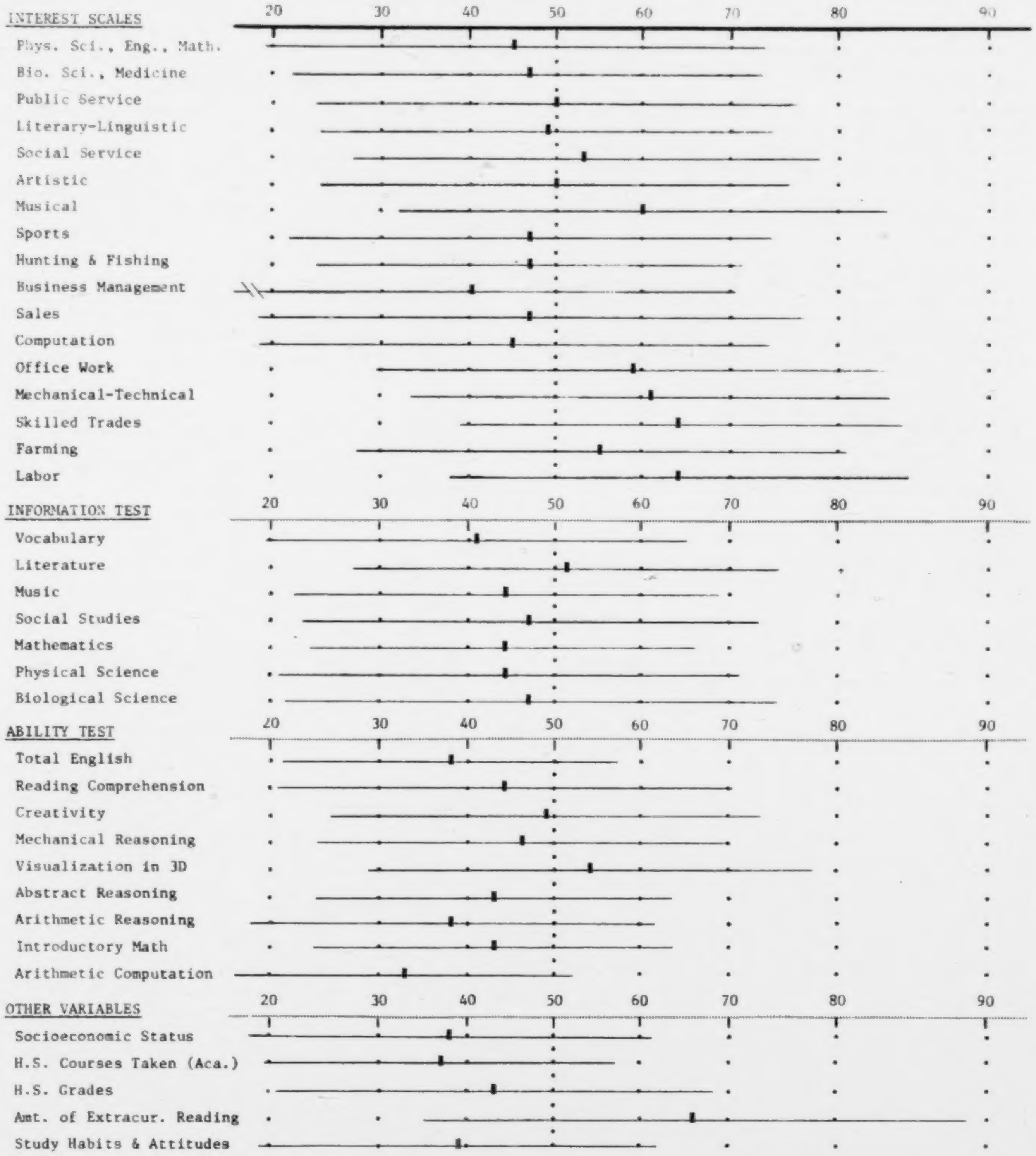
Others

General: High (66th percentile) in extracurricular reading; low (38th percentile) in socioeconomic status, academic orientation of courses, and study habits and attitudes.

Specific: 41st percentile in sociability.

MILITARY - Enlisted

(Male - n = 80)



NURSE - Practical

Importance: Not enough graduate (registered) nurses to care for all the patients who need nursing. Gap filled by practical nurses, at less expense to patient or hospital.

Training: Licensed by states, after training course and examination. 8-12 years schooling required, plus physical examinations and aptitude tests, for entrance into training course. Courses given by vocational high schools, junior colleges, hospitals, etc. Many courses sponsored by government. Usually take one year; include classroom study, clinical practice, supervised work.

Work Activities: Care for physically and mentally ill; provide nursing care that does not require professional training. Provide bedside care, take temperature and blood pressure. Assist registered nurse, care for infants, watch patients in recovery rooms. May help supervise hospital attendants. In private homes, care for patients and prepare their meals; instruct family members. In doctors' offices and clinics, prepare patients for examination and treatments, make appointments, keep records.

Three-fifths of practical nurses work in hospitals; others in nursing homes, clinics, doctors' offices, sanitariums, etc. Some self-employed.

Outcomes: Improved health or comfort of patient; assistance to registered nurse or physician.

Supervision; Social Relations: Unless self-employed, usually supervised by registered nurse or physician. Capacity for teamwork essential.

Salary; Other Benefits: Starting salaries averaged $110 a week in 1970. In private homes, $15-$30 for 8-hour day. In public health agencies averaged about $5,750 year. Starting salary in federal jobs $5,212.

Role of Sexes: Great majority of practical nurses are women.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest score (70th percentile) in biological science; high (62nd percentile) in physical science, mechanical-technical, skilled trades, farming, and labor; lowest (37th percentile) in business management, and office work.

Information

General: Average around 50th percentile on information scores; highest (55th percentile) in physical science, and biological science; lowest (47th percentile) in vocabulary, and literature.

Specific: 48th percentile in health.

Abilities

General: Around the 48th percentile on ability scores; highest (51st percentile) in creativity, mechanical reasoning, three-dimensional visualization, and introductory math; lowest (32nd percentile) in arithmetic computation.

Specific: High (50th percentile) in memory for words.

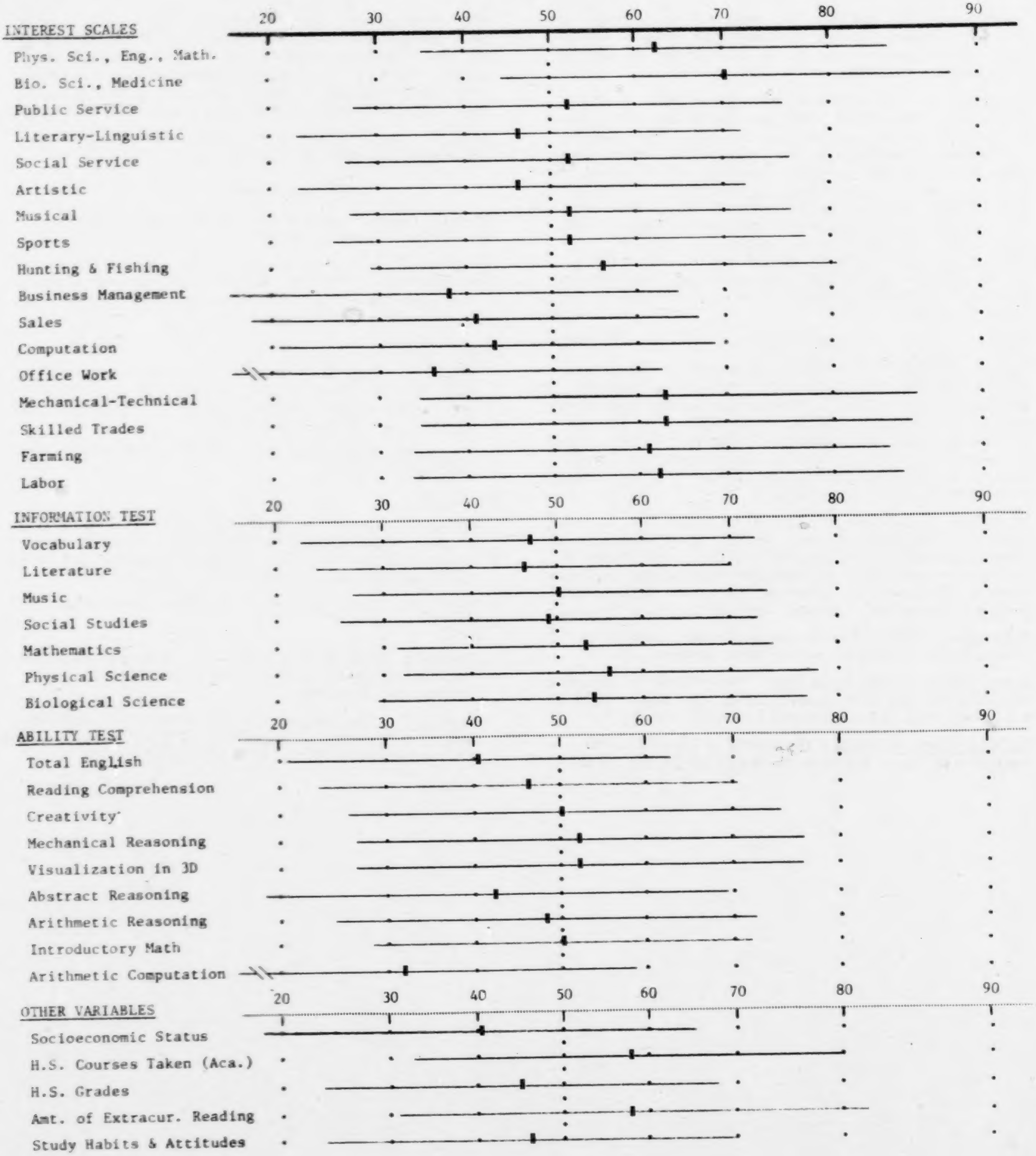
Others

General: High (58th percentile) in academic orientation of high school courses, and amount of extracurricular reading; low (40th percentile) in socioeconomic status.

Specific: 45th percentile in sociability, social sensitivity, self-confidence, and self-perception of reading skills.

NURSE - Practical

(Female - n = 489)



POLICEMAN

Importance: Law enforcement necessary to maintain an orderly society. Modern circumstances make it necessary for law enforcement to be carried out by persons with special training.

Training: Police officers employed by both local governments and states must usually be 21, pass physical examinations, and succeed in competitive tests. Background investigated. In large police departments and for states must usually have high school education. College courses in sociology, psychology, etc. helpful, and college training may be required for policewomen. In some places teenager may enter as trainee or cadet and do routine work till he enters the force at 21. Training usually given by police department itself, to men already on the job. For state police, recruit gets several months' formal training. College training often provided.

Police training on the job continues for much of career.

Work Activities: Policeman working for local government prevents criminal activity and investigates it when it occurs. Aids in prosecution of persons apprehended. May direct traffic, give first aid, work to prevent juvenile delinquency, do detective work, take fingerprints, operate communications system. Keeps records and turns in reports. Policewomen specialize in work with women and children.

State police officers responsible chiefly for the highways. Enforce traffic laws, assist at accidents, call help for stalled cars, direct traffic, give driver's tests. May assist in general law enforcement in areas without local police. Some do laboratory work, pilot police helicopters. Prepare reports and keep records.

Outcomes: Maintenance of law and order, prevention of crime; safeguarding of public from injury.

Supervision; Social Relations: Supervised by superiors in rank, but may work alone much of the time. Good relations with colleagues and public necessary.

Salary; Other Benefits: Beginning police officers employed by local governments averaged $8,500 in 1970; more experienced officers $10,000. State police officers usually had entrance salaries of about $400-$700; maximum $700-$900; more if promoted to corporal or above. Night and weekend work sometimes necessary. Good pension plans, often allowing early retirement; paid vacations, sick leave, health and life insurance.

Role of Sexes: Majority of police officers are men, but number of women is increasing.

PERSONAL CHARACTERISTICS

Project TALENT people who chose this occupation had the following characteristics in high school:

Interests: Highest scores (50th percentile) in public service, social service, musical, and farming; lowest (42nd percentile) in physical science, artistic, business management, and sales.

Information

General: Average around 50th percentile on information scores; highest (54th percentile) in literature, and music; lowest (48th percentile) in physical science, and biological science.

Specific: High (61st percentile) in military; 53rd percentile in law.

Abilities

General: Around the 45th percentile on ability scores; highest (51st percentile) in reading comprehension, creativity, and arithmetic reasoning; lowest (37th percentile) in arithmetic computation.

Specific: 54th percentile in memory for words.

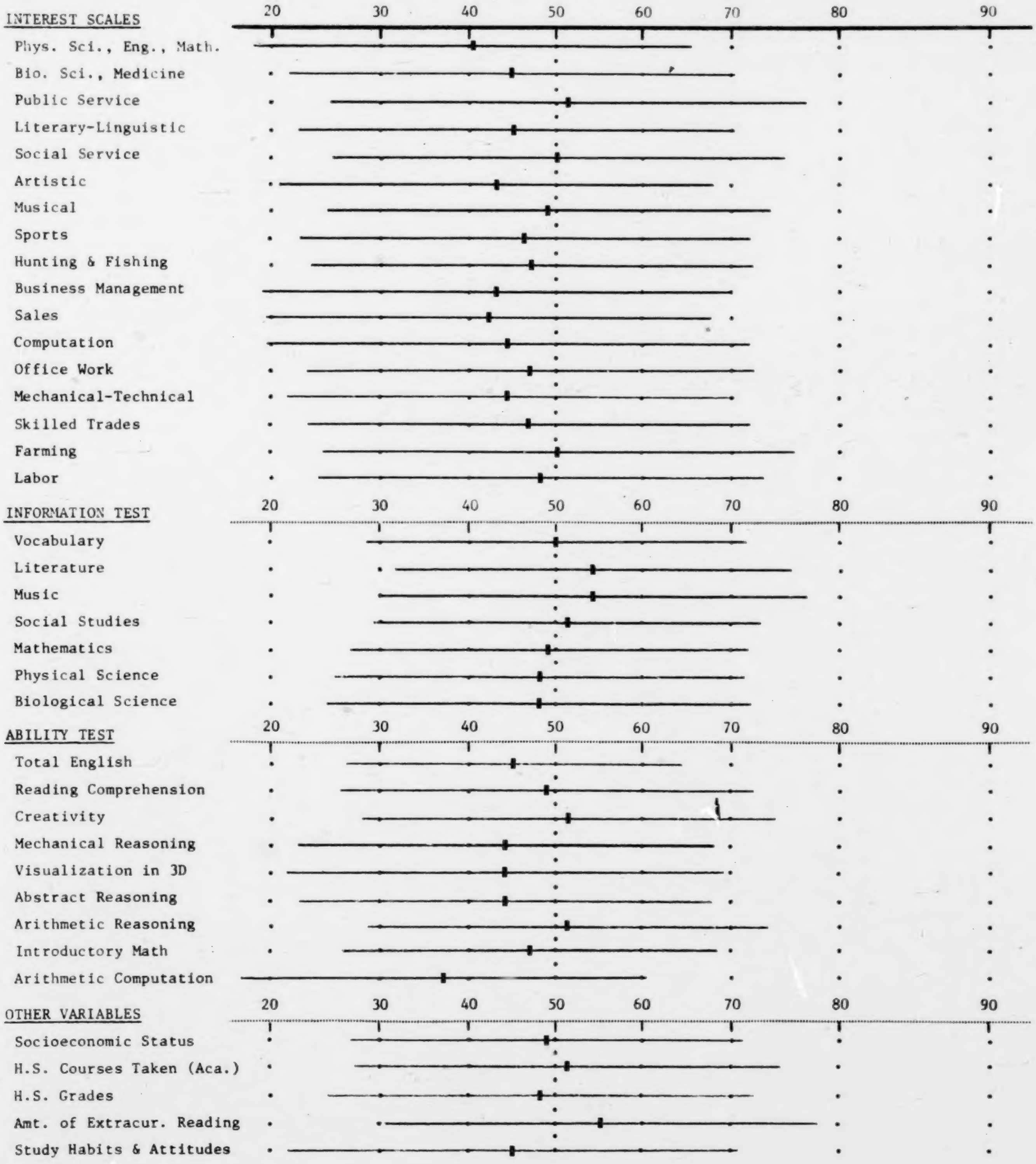
Others

General: High (55th percentile) in amount of extracurricular reading; low (45th percentile) in study habits and attitudes.

Specific: 50th percentile in sociability, maturity, and self-perception of reading skills; 56th percentile in social sensitivity, and self-confidence.

POLICEMAN

(Male - n = 540)



APPENDIX A
PART I. TESTS AND INVENTORIES INCLUDED IN THE *DATA BOOK* PROFILES

The Interest Inventory

When we began the task of constructing the TALENT Interest Inventory, we first examined and evaluated the published inventories, including the Strong and Kuder instruments. We decided to devise a new inventory, designed to fit the special needs of our study.

The first question confronting us was whether to devise a measure using a rating scale or a ranking method. On a rating scale, the student expresses his liking, disliking, or indifference in regard to each occupation or activity presented, as in the following example:

> For each occupation listed below, you are to consider whether or not you would like that kind of work . . . Mark your answers as follows:
> A. I would like this very much.
> B. I would like this fairly well.
> C. Indifferent or don't know much about it.
> D. I would dislike this a little.
> E. I would dislike this very much.
> 1. Surgeon
> 2. Chemist
> 3. Civil engineer
> 4. Writer
> 5. Social worker

A ranking procedure presents several occupations or activities together and asks the student to choose the one that he likes the most and the one that he likes the least, as in the following example:

> For each group of occupations listed below, indicate the one you would like most and the one you would like least:
> A. Mathematician
> B. Machinist
> C. Dietitian

We preferred the rating procedure because it would enable us to report how many students in the country would like to become surgeons, auto mechanics, teachers, and so on. A ranking procedure, we felt, would confuse the issue because the student would be forced to choose among alternatives. Moreover, it would not yield information on how many young people might like to become surgeons, for example, but only on how many would prefer being a surgeon to being a lawyer.

The Variables of the Interest Inventory

The following variables constitute the scales of the Interest Inventory which are shown for all careers and occupations in the **Career Data Book:**

1. Physical Science, Engineering, Mathematics
2. Biological Science, Medicine
3. Public Service
4. Literary-Linguistic
5. Social Service
6. Artistic
7. Musical
8. Sports
9. Hunting and Fishing
10. Business Management
11. Sales
12. Computation
13. Office Work
14. Mechanical-Technical
15. Skilled Trades
16. Farming
17. Labor

All of these interests were evaluated in a single long questionnaire of 205 items. To each item the student was asked to respond

A Like very much
B Like fairly well
C Indifferent or don't know
D Dislike a little
E Dislike very much

These responses were scored 40, 30, 20, 10, and 0, respectively. The first 122 items are simply listings of various jobs which fall within the fields of interest being estimated. For example, the student states how he feels about being a dentist (on the biological science and medicine scale) or a riveter (on the skilled trades scale). In the last 83 items, he is asked to make the same kind of decision about specific activities, each of which comes within one of the fields of interest under consideration (except a few items which were in none of the scales). Examples of these are "Sell furniture" (for sales interest) and "Direct people" (for business management).

Each of the fields of interest and the items used to measure it are discussed separately below.

In describing each of the Interest Scales and all other scales or tests in the remainder of this Appendix, we give both the TALENT code name of the scale or test and its English name. We give the code name largely for matter of record and any future discussion. However, inherent in the code name is also indication of how the score on the scale or test is obtained. For instance, the TALENT code name for a variable consists of a three-digit number prefixed by a capital letter indicating the kind of score, i.e., method of calculation of the score. The capital letters used as prefixes for variable numbers have the following meanings:

R = number of **R**ight responses
P = **P**er-item score (average score of alternative chosen)
P* = Standardized **P**er-item score
F = Other **F**ormula score

This score is usually a function of the R and A scores, or of R and W, or of variable weights for item responses. The F scores may represent either empirical or **a priori** scoring formulas.

P-701. Physical Science, Engineering, and Math

The occupations appealing to this interest which are included in this questionnaire are chemist, civil engineer, astronomer, research scientist, chemical engineer, aeronautical engineer, electrical engineer, mining engineer, mechanical engineer, and mathematician. The student is also asked whether he likes physics, calculus, chemistry, playing chess, solving puzzles, and algebra.

P-702. Biological Science and Medicine

Here the occupations listed are those of surgeon, dentist, doctor, and biologist, and the activities listed are biology, physiology, studying muscles and nerves, and learning about diseases.

P-703. Public Service

For this the questionnaire lists the occupations of cabinet member, judge, U.S. Senator, politician, U.S. Congressman, mayor, President of the U.S., Vice President of the U.S., state governor, and public administrator. The activity listed is campaigning for political office.

P-704. Literary-Linguistic

The jobs listed for this field of interest are those of foreign correspondent, editor, lawyer, reporter, novelist, librarian, interpreter, writer, college professor, and poet. The activities are reading, writing letters, foreign language, literature, writing themes, and poetry.

P-705. Social Service

The occupations listed here are those of social worker, elementary school teacher, nurse, clergyman, guidance counselor, high school teacher, religious worker, and school principal. The activities are taking care of members of family, helping parents, helping the poor, and teaching children.

P-706. Artistic

The jobs listed here are sculptor, architect, decorator, artist, and designer. The activities listed are visiting art galleries and museums.

P-707. Musical

Occupations listed are those of musician and musical composer. Activities are practicing music all day, symphony concerts, playing an instrument.

P-708. Sports

Jobs listed are those of professional athlete, sports umpire or referee. Activities are basketball, tennis, football, track, swimming, and baseball.

P-709. Hunting and Fishing

No jobs are listed for this interest classification. Activities listed are fishing, trapping wild animals, and hunting.

P-710. Business Management

Jobs listed are those of foreman, college president, personnel administrator, president of a large company, building contractor, office manager, and banker. Activities are planning work for other people, firing a person, managing a large store, hiring a person, giving orders to workers in a factory, directing people, and arranging a strike settlement with management.

P-711. Sales

Jobs listed in this interest area are those of insurance agent, stock salesman, real estate agent, and salesman. Activities listed are selling furniture and selling merchandise to stores.

P-712. Computation

Jobs listed for this interest area are those of bookkeeper, bank teller, statistician, certified public accountant, and accountant or auditor. Activities are making out income tax returns, working arithmetic problems, preparing cost estimates, operating a calculating machine, and keeping accounts.

P-713. Office Work

Jobs listed for the office work interest category are those of office clerk, secretary, typist, and switchboard operator. Activities are keeping records for a store, typewriting, and doing clerical work.

P-714. Mechanical-Technical

Jobs listed for the mechanical-technical interest area are those of toolmaker, automobile mechanic, plumber, electrician, technician, electronics technician, laboratory technician, repairman, machinist, and welder. Activities are inventing new tools, making a radio set, fixing a clock, repairing an auto, and shop work.

P-715. Skilled Trades

The skilled trades listed are those of butcher, tailor or dressmaker, dietitian, fireman, bricklayer, riveter, house painter, beautician, railroad brakeman, shoemaker, paperhanger, carpenter, and typesetter. The activities listed for this interest area are fixing furniture, working on an automobile assembly line, operating a power machine, operating a crane or derrick, and doing odd jobs with small tools.

P-716. Farming

Farming jobs listed are those of rancher, forester, and farmer. Activities are raising sheep and cattle for market, operating farm machinery, feeding hogs and cattle, and gardening.

P-717. Labor

Jobs listed for the labor interest category are those of cab driver, longshoreman, dishwasher, maid, building superintendent, factory worker, deliveryman, and truck driver. Activities are washing and ironing clothes and working in a steel mill.

The Information Test

The Information Test is really several tests rolled into one. Its purpose is multiple. The test may be so scored as to measure the breadth of the student's general information, his vocabulary level, and the amount of information he has in many specific areas. But the test was also designed to help determine a student's general attitude toward natural phenomena — whether he tends to take a scientific view in evaluating hypotheses, or whether his general attitude makes him receptive to explanations which are superstitious or otherwise illogical.

Let's examine more closely each of the purposes for which the Information Test is designed, and the historical background that preceded the development of this test.

1. **Measures of breadth of general information.** Information tests covering a wide range of topics have been used as components of general intelligence tests as far back as World War I, when the Army Alpha Test was given to all recruits who could read and write. One of the eight subtests of the Army Alpha was a test of information, covering a wide range of subject matter. For instance, it included items testing information on animals and birds, physical science, biological science, farming, mechanics, social studies, electricity, medicine, games, business, foods, airplanes, sports, guns, law, literature and art. Arthur S. Otis, who played a leading role in the development of the Army Alpha, later used information items as one of the chief components of his widely used intelligence tests (the Otis Self-Administering Tests of

Mental Ability and the Otis Quick-Scoring Mental Ability Tests).

Information tests as indicators of general intelligence have been considered important from the time they were first developed and are still so considered.

2. **Measures of interest.** In the 1930's there was some experimentation with information and vocabulary tests to measure interest patterns. For instance, there was the Michigan Vocabulary Profile Test, developed by E.B. Greene in 1937. This test consisted of eight subtests, measuring vocabulary in human relations, commerce, government, physical science, biological science, mathematics, fine arts, and sports. The total score on this test provides a measure of general vocabulary. But the innovation which distinguished this test from its predecessors was the recommendation that the profile of subtest scores be used to provide a clue to a person's relative interests in different areas. Such a suggestion was based on the premise that the individual will tend to know a good deal about areas in which he has a deep interest. Thus, if the profile of his subscores shows peaks and valleys, these extremes may be taken to suggest areas where his interests, and thus perhaps his ability to succeed, are greatest and least.

The use of information tests to suggest whether an individual has sufficient interest in an activity to succeed in it was greatly expanded and systematized during World War II in the Army Air Force Aviation Psychology Program. It proved successful in the battery of Aircrew Classification Tests designed to predict success as a pilot, bombardier, or navigator.

A battery later developed by the American Institutes for Research to select airline pilots and flight engineers made use of many principles and methods which had proved effective in the Air Force. Among them was the use of information tests to provide an "operational" measure of interest in flying — a measure based not merely on claiming interest, but on demonstration of interest by the acquisition of information.

3. **Measures of information in specific areas.** In addition to indicating relative interest in different areas, subscores on a general information test are also useful as direct measures of the amount of information acquired in an area — for instance, physical science, fine arts, or sports. The Michigan Vocabulary Profile Test, which has already been mentioned, provides such scores.

Are such scores measures of achievement, or do they measure aptitude? The answer is, they can measure either, or both, depending on the way the scores are interpreted and used. Acquisition of information in a particular area, such as science, certainly represents a kind of achievement. And, in the sense that past performance predicts future performance, achievement would constitute an index of aptitude. In fact, there are certain areas in which these joint achievement-aptitude tests based on amount of information acquired have proved outstandingly useful as predictors or indicators of job aptitudes. Among the areas to which this would apply are mechanics, electrical and electronic work, and aeronautics. The TALENT Information Test items in these three areas may thus be regarded not only as contributing to the total Information score, but also as constituting important separate tests in their own right.

4. **Measures of vocabulary.** The size of a person's general vocabulary has long been recognized as one of the best indices of that aspect of general intelligence called "verbal intelligence." Vocabulary tests have played a role in intelligence testing ever since the Binet scale was developed in 1905. Almost every intelligence test (except those specifically designed to be non-verbal) contains either a vocabulary subtest or vocabulary items scattered throughout the test.

5. **Measures of scientific attitude.** Interspersed among the items of the Project TALENT Information Test were items designed to measure scientific attitude. This was one of the Project's experimental ventures in testing.

General Variables of the Information Test

The following variables constituted the scales of the Information Test whose scales are shown for all careers and occupations in the **Career Data Book**:

1. Vocabulary
2. Literature
3. Music
4. Social Studies
5. Mathematics
6. Physical Science
7. Biological Science.

Information Tests
Sub-Scales

R-102. Vocabulary

This score gives some indication of the relative size of the student's general vocabulary. This is often used as an index of academic aptitude, and the ability measured by this test is sometimes called "verbal intelligence." However, this interpretation is not relevant to the present book.

R-103. Literature

The purpose of this scale is to measure familiarity with the world of literature. Both prose and poetry are included. Some, but not all, of the literary works on which test items are based are required reading in many schools, and they are on recommended reading lists in other schools. However, the items are not limited to reading that is likely to have been done in school. The test's broad coverage makes it likely that a student who has acquired a habit of recreational reading will get a reasonably good score regardless of what specific books are required reading in his school.

R-104. Music

The items in the Music scale sample information in many areas of music, including kinds of compositions, kinds of voices, composers, singers, musical instruments, and orchestral forms.

This score is intended to indicate amount of musical information, not musical talent. Those who enjoy going to concerts and opera, or listening to serious music on radio and the phonograph, are likely to get a good score, as well as those having formal training in music.

R-105. Social Studies

This scale covers facts and concepts from the fields of history, economics, government and civics, geography, and current affairs. At least half of the history, government, and geography items are concerned with the United States, but there is coverage of the rest of the world too. Social studies content taught in elementary school has been sampled, as well as that taught in high school.

R-106. Mathematics

These items are concerned with definitions, the vocabulary of mathematics, mathematical notation, other kinds of factual information, and the understanding of mathematical concepts. None of the items requires computation or reasoning or calls for solving a problem, since these abilities are covered by other tests in the battery (the Arithmetic Computation Test and the Mathematics Test, described below). Nearly half the items are on topics covered in Grade 9 or earlier, and the rest are concerned with topics that are not usually touched upon until at least the tenth grade.

R-107. Physical Sciences

This scale includes items about chemistry, physics, astronomy, and other physical sciences. Many of the items cover information that might readily be acquired in other ways than through formal instruction.

R-108. Biological Sciences

This scale includes items about botany, zoology, and microbiology. A few items about nature lore are included, though most of the items are concerned with more formal aspects of biological science.

Occupationally Specific Variables of the Information Test

The following variables constitute the scales of the Information Test which were used only in particular instances in describing the career and occupational characteristics:

1. Scientific Attitude
2. Aeronautics and Space
3. Electricity and Electronics
4. Mechanics
5. Farming
6. Home Economics
7. Sports
8. Art
9. Law
10. Health
11. Engineering
12. Architecture
13. Foreign Travel
14. Military
15. Accounting, Business, Sales
16. Bible
17. Hunting
18. Fishing
19. Outdoor Activities (other)
20. Theater and Ballet

Each of these scales is described more fully below.

R-109. Scientific Attitude.

This scale indicates how the individual views the world — whether he views it as a place where there are logical cause-and-effect relationships, or whether he regards it as a place where consequences are illogical and arbitrary. In the latter category fall the modern-day equivalents of the primitive beliefs that have been called "sympathetic magic." Also in the category of illogical and arbitrary consequences are the premises of palmistry, astrology, and numerology.

R-110. Aeronautics and Space

These items are on such topics as piloting procedures, navigation, jet planes, and space exploration. Much of the information that the student has in this area is likely to have been acquired out of school.

A high score on this test is likely to indicate not only information, but interest in modern space technology.

R-111. Electricity and Electronics

These items stress information that is acquirable through direct experience in the construction and maintenance of electrical and electronic equipment. Students who have worked on radios, hi-fi sets, or other electronic equipment, or on mechanisms with electric motors, should get good scores. Since the range of content covered is fairly broad, it seems likely that average high school students will be able to answer many of the questions if at all interested in the area.

R-112. Mechanics

These items tap a wide range of information. Many of them are concerned with automobiles; others are concerned with other common machines and tools with which boys who are interested in mechanical activities are likely to be familiar. The emphasis is on information that is likely to be acquired through direct experience with tools, engines, and motors. The scores should also be influenced by the amount of experience and training in mechanics the student has had.

R-113. Farming

These items include the information that children who grow up on farms or ranches are likely to acquire. The items give some advantage to those who have an interest in rural life.

R-114. Home Economics

These items test information on cooking, sewing, caring for babies, cleaning, and other activities of a domestic nature. Students who have engaged in such activities, whether as a chore, or part-time job (e.g., baby-sitting), or just because they enjoy them, as well as students who have had formal instruction in home economics, should have an advantage on these items.

R-115. Sports

These items test knowledge of the sports of most interest to young Americans. Some of the questions are such as could be answered from newspaper reading. Others require a detailed knowledge of the sport which would probably be possessed only by a participant or by an enthusiastic fan.

R-131. Art

This scale measures knowledge about art which may have been acquired through participating in art as a hobby or for personal expression. Those who enjoy going to museums and art galleries, reading about art, and engaging in it should have an advantage on these items — as should those who have had special training in art. However, there is no reason to think that this scale will identify those with creative talents in art.

R-132. Law

These items primarily measure "general information," so that a good score on this scale is not necessarily indicative of interest in law. Nevertheless it seems probable that a student whose score in this area is relatively low is not likely to have enough interest in law to make it an advisable career for him.

R-133. Health

Among the areas included are knowledge of physiology, nutrition, first aid, common ailments, physicians' instruments, and training requirements for medical and nursing careers.

R-134. Engineering

The engineering items are indicative of interest in and aptitude for engineering as a career. They deal with tools and equipment used by engineers, methods of construction, and information about major engineering works.

R-135. Architecture

Those who have read books and articles about architecture and students whose interest has manifested itself in other ways — for instance, through conscious observation of the architecture around them — do well on these items.

R-137. Foreign Travel

The questions on foreign travel are concerned with foreign nomenclature, and with geographical and cultural facts about foreign cities and areas. They are capable of being answered from general reading and do not require experience of actual travel on the part of the testee.

R-138. Military

The items testing military information deal largely with military organization and nomenclature. They can be answered by persons who have had close contact with the military services or who have a high degree of interest in them.

R-139. Accounting, Business, Sales

The questions on accounting, business, and sales are largely on terms used in these fields. A few items on personal finance are included.

R-142. Bible

Items on the Bible refer to some of the best-known Biblical stories and quotations. They are drawn from both the Old and the New Testaments. Most of them could be answered from general reading without a direct study of the Bible or any specific religion.

R-145. Hunting

The questions on hunting deal mainly with guns, ammunition, and other hunting equipment, and to a small extent with the habits of wildlife.

R-146. Fishing

The items on fishing deal mainly with fishing equipment, though one item is included on choice of bait for a particular type of fish.

R-147. Outdoor Activities

Outdoor activities items deal with outdoor activities other than hunting and fishing. These include camping, swimming, etc., with one item on wildlife.

R-150. Theater and Ballet

These items indicate an interest in the theater and ballet. (It is somewhat doubtful, however, that it is possible to get much differentiation between those who are interested in the stage and ballet as a career and those who merely are interested spectators.) Most of the items deal with theater and ballet terms (for example, greasepaint, footlights).

The Ability Tests

The probing for patterns of aptitude and ability continued by means of tests which sought more than a student's fact-absorbing capacities.

Previous research had indicated that human ability depends heavily on memory (probably more than one kind), language and mathematical skills, and ability to visualize movement in two or three dimensions. But perhaps central in the aptitude pattern are reasoning ability and creativity.

Therefore, in addition to testing knowledge of facts by using the Information Test, we tested for the wide range of abilities suggested above. The nature and background of the tests used for these purposes are described below.

General Ability Variables

The following variables constituted the scales of the Ability Test which are included for all careers and occupations:

1. Total English
2. Reading Comprehension
3. Creativity
4. Mechanical Reasoning
5. Visualization in Three Dimensions
6. Abstract Reasoning
7. Arithmetic Reasoning
8. Introductory Mathematics
9. Arithmetic Computation

Each of these scales is described more fully below:

R-230. Total English Score

The purpose of this test is to measure ability to express oneself adequately in English. A total score is reported based on spelling, capitalization, punctuation, English usage, and effective expression. The test is primarily concerned with written English, but presumably some generalization to spoken English on the basis of the English usage and effective expression items is justifiable.

In recent years there has been increasing concern over the deficiencies of high school graduates in expressing themselves effectively in acceptable English. An achievement test in English given early in the student's high school career can be useful in pointing out deficiencies and the possible need for remedial work.

R-250. Reading Comprehension

The purpose of this test is to measure the ability to comprehend written materials. The ability measured is the ability to read with comprehension, rather than merely ability to pronounce or recognize the printed word without understanding the fact, idea, or concept that the writer is attempting to convey. The test includes passages on a wide range of topics. The student reads the passage and then answers a number of questions about it, referring back to the passage as often as he likes. None of the items is answerable without reading the passage.

The ability measured by this test is sometimes called "academic intelligence" and is a good predictor of school success in an academic or liberal arts curriculum. In the unusual situation where a student scores low on the reading comprehension test but obtains good scores on other types of intellectual tests, he may have a specific reading disability that can be corrected by special remedial training.

R-260. Creativity

The purpose of the Creativity test is to measure a student's ability to find clever solutions to problems requiring ingenuity. The problems are practical ones which might actually be encountered in real life. The items are set up in such a way that the student must actually develop or "create" the solution, rather than merely pick it from among several presented.

There has been much interest in identifying inventive ability or ingenuity early. It is an important part of many scientific occupations and a potentially valuable ability.

The student who scores well on this test should have a certain degree of inventiveness, or creativeness. A high score would suggest that he might do well in activities which involve creating new and original solutions to challenging complex problems.

R-270. Mechanical Reasoning

The purpose of this test is to measure the ability to understand and visualize the effects of the operation of everyday physical forces and principles (such as gravitation, pressure, equilibrium), and basic kinds of mechanisms (such as gears, pulleys, wheels, springs, levers). A kind of reasoning which is related to mechanical aptitude is involved.

In interpreting scores on this test, account should be taken of mechanical experience or formal training in physics. What the test measures is only one of the abilities necessary for success in mechanical occupations. Engineers, for example, may need a high degree of abstract reasoning, and mathematical and mechanical abilities, while mechanics such as craftsmen may need only mechanical ability and a minimum amount of reasoning and mathematical abilities.

There is a great deal of evidence that a high score on a mechanical reasoning test is important for success in a large number of occupations ranging from piloting an airplane to maintaining a truck.

R-282. Visualization in Three Dimensions

This test measures the ability to visualize manipulation in three dimensional space. The questions consist of a diagram of a flat figure and five pictures of solid objects, one of which might have been made by folding the flat figure.

Visualization tests have been widely used in aptitude test batteries. This visualization ability is involved in many occupations of a technical, mechanical, or engineering nature. The ability to do many of the tasks of a design engineer, carpenter, mechanical draftsman, and the like, are also involved, as well as the ability to pilot an aircraft or a ship.

This type of test is useful for selecting students who are likely to do well in shop courses. It is also useful in selecting people for semiskilled jobs such as assembly, machine operation, and packing.

R-290. Abstract Reasoning

Several tests of this type have been used as parts of academic aptitude tests and college entrance tests. The test is one of reasoning ability, and would be especially appropriate for use with a student who has just come to the country and has limited English ability. The test measures one kind of reasoning ability — the ability to determine the logical relationships among elements of patterns with one part missing and discover the relationship needed to complete the pattern.

A high score on this test may be interpreted as indicating the potential for good work in academic curricula. Students who score low in vocabulary and reading but high on this test may still have a good potential for academic work. However, low scores on the other tests would indicate that considerable remedial work might have to be done before the individual would be ready for any advanced work. The student who scores well on this test and also on reading, vocabulary, and mathematics, should be a very good student in high school and beyond. A low score on this kind of test together with high scores on the more verbal tests would indicate an interest pattern consistent with work in the humanities rather than in engineering and the sciences.

R-311. Arithmetic Reasoning

Arithmetic reasoning tests are intended to measure the ability to do the kind of reasoning required to solve mathematics problems. Actual computation except at a very simple level is not included in this test. Most of the problems require the student to tell how he would go about solving a problem, rather than requiring the solution. Arithmetic reasoning ability is considered to be one of the chief components of general academic ability.

A person scoring well on this test should be capable of a high level of achievement in educational programs or training courses where mathematics is important. In addition, such an individual should be able to deal with certain complex problem-solving situations even though the problems may not be mathematical in nature.

R-312. Introductory Mathematics

The purpose of this subtest is to measure achievement in all kinds of mathematics generally taught up to and including the 9th grade, with the exception of areas covered in the Arithmetic Computation Test and in the Arithmetic Reasoning Test. The primary emphasis of this test is on elementary algebra; other topics include fractions, decimals, percents, square roots, intuitive geometry, and elementary measurement formulas. While the topics covered are taught in grade 9 or earlier in most schools, curricula differ considerably in regard to grade placement of various topics.

F-410. Arithmetic Computation

The purpose of this test is to measure the speed and accuracy of computation including addition, subtraction, multiplication, and division with whole numbers.

This test measures the ability to perform simple numerical computation rapidly and accurately. Scores on this type of test are not highly related to scores on the arithmetic reasoning or other mathematics tests. It is possible to do well in mathematics without being outstanding in simple computational work. However, a student low on computation would probably be handicapped in an occupation requiring rapid and accurate computing, such as bookkeeping or accounting.

Occupationally Specific Ability Variables

The following variables constituted the ability scores which were used only in particular instances in describing the career and occupational characteristics:

1. Memory for Words
2. Disguised Words
3. Word Functions in Sentences
4. Visualization in Two Dimensions
5. Advanced Mathematics
6. Table Reading.

Each of these variables is described more fully below:

R-212. Memory for Words

The purpose of this test is to measure one kind of rote memory — the ability to memorize foreign words corresponding to common English words. This ability is obviously directly relevant to the learning of a foreign language. It is also presumably related to the ability to learn many other kinds of material.

The task imposed by the test is to memorize pairs of arbitrarily associated words; one member of each pair is a word in a hypothetical foreign language, and the other is the corresponding English word. The items require the student to identify the English translation of each "foreign" word.

R-220. Disguised Words

In this test, a word is represented by certain letters which suggest the sound of the word, for example, "STRAT" for "straight"; or "DLA" for "delay." The task is to identify the word.

The vocabulary level is basically quite simple, so that the extent of an individual's vocabulary should not affect the score.

This test measures the ability to become used to "strange" modes of spelling ordinary words — in other words, the ability to puzzle out from the context and appearance the meaning of a word which is vaguely reminiscent of a familiar English word. This ability is probably one aspect of aptitude for learning shorthand or a foreign language.

R-240. Word Functions in Sentences

This test is intended to measure the student's sensitivity to grammatical structure. The fact that the terminology of grammar is not used at all in the test helps reduce the effects of formal training to a minimum. To score well, one must understand something about structure of a sentence and recognize the function of each word or phrase in the sentence. This ability is probably related to the ability to learn the grammar and characteristic sentence structure of a foreign language. It is probably also related to the ability to learn the formal rules of English grammar. The test was made difficult deliberately, since there is reason to believe that a hard test would predict ability to learn foreign languages better than an easier one.

R-281. Visualization in Two Dimensions

This test is intended to measure the ability to visualize manipulation of a figure in two dimensional space. Each question consists of a diagram followed by five other diagrams; the task is to determine which of the five diagrams is exactly the same as the first one, though turned around to a different position. The other four diagrams not only are turned to a different position but they are mirror images.

R-333. Advanced Mathematics

This subtest covers topics normally taught in Grades 10-12 in college-preparatory courses. As in the case of Introductory Mathematics, the items are intended primarily to test understanding and application of basic concepts and methods, not rote memory. A wide range of subjects is included: plane geometry, solid geometry, algebra, trigonometry, elements of analytic geometry, and introductory calculus. It should be noted that some of these subjects are not offered in most high schools. However, students who have taken college-preparatory mathematics beyond the Grade 9 level, and have really understood it, should be able to score well.

F-420. Table Reading

The purpose of this test is to measure the ability to obtain information rapidly and accurately from a table. This is a kind of clerical aptitude. The score on this test should be interpreted as a measure of the ability to do jobs such as getting data from various kinds of tables. This ability is important in jobs such as those of navigators, accountants, bookkeepers, and statistical clerks. This kind of clerical aptitude is somewhat more complex than that measured by a clerical checking test.

A person scoring low on the Table Reading Test might be handicapped in an occupation in which this sort of activity plays an important part.

The Student Activities Inventory

The Student Activities Inventory consists of 150 self-descriptive terms dealing with aspects of the student's personality. One purpose of including a personality inventory in the Project TALENT battery was to gather information about how personality differences help to account for differences in the accomplishments of equally talented people. No attempt has been made to diagnose or measure severe personality disorders. On the contrary, the inventory was intended for normal individuals in an effort to provide information about the way people use their talents and abilities. Another purpose was to obtain information about the employability of individuals with low academic aptitude. There is evidence to suggest that the employability of such individuals depends to a considerable extent on their personality traits. Jobs that do not demand a high level of academic aptitude nonetheless often require their holders to be mature, self-controlled, vigorous, etc.

Previous work in personality measurement plus careful theoretical analysis provided a foundation for defining a number of relatively homogeneous aspects of the behavior of high school students. These were not designed to cover all of the activities of high school students but merely to sample these activities. Each trait was defined by grouping adjectives that describe similar types of behavior. For example, a trait such as impulsiveness is typified by "hasty," "impulsive," "rash," etc.

Item statements were usually derived from such adjectives; the adjective "calm" might lead to the statements, "I am usually calm," "I rarely lose my temper," or "I get easily upset." A group of such statements formed the basis for measuring each trait. The students responded to the item statements in accordance with the following directions:

"Regarding the things I do and the way I do them, this statement describes me.

A. extremely well.
B. quite well.
C. fairly well.
D. slightly.
E. not very well."

Occupationally Specific Variables of the Student Activities Inventory

The following variables constitute the scales of the Activities Inventory which were used only in particular instances in describing the career and occupational characteristics:

1. Sociability
2. Social Sensitivity
3. Self-confidence
4. Mature Personality

The Student Activities Inventory measures certain qualities of character and personality through the behavior, or activities, of the student. Of the ten traits thus measured in TALENT, we are using only the four above as specific variables.

In TALENT, the items used to measure these qualities were all contained in a single composite questionnaire, so that the student was not certain which trait was being measured by any one question.

601. Sociability

This refers to liking and need for the company of others. Items included for this area relate to gregariousness and ability to make friends.

602. Social Sensitivity

This scale measures empathy; ability to feel with and for others, sympathy, understanding, tact, and considerateness.

609. Self-confidence

This scale measures confidence in one's own ability to meet life's requirements, both socially and in regard to work, acceptance of criticism, lack of self-consciousness, and ability to function in a public situation.

610. Mature Personality

This scale considers mature personality chiefly in the sense of industry, persistence, dependability, and productivity. Items included for this area relate to the characteristics of a hard-working, conscientious, and reliable employee.

Student Information Blank

This 396-item inventory was used to obtain data on students' background and plans, including: personal experiences involving hobbies, organizational and club memberships, dating, and work experiences. There were questions regarding school and study habits. Students were asked about their parents' occupations, parents' education, and general questions regarding the family financial situation.

The questions were largely objective, asking about verifiable facts or events rather than for subjective reports of personal feelings. Students were not required to write their answers, but to select one of several responses and to indicate their selection on the answer sheet. The responses were written to offer two to 36 choices, depending on the question. For most questions there were five or six response categories.

Three questions are shown below, as examples of leadership experience, work experience, and social experience:

How many times have you been president of a class, a club, or other organization in the last three years?

A. None
B. Once
C. Twice
D. Three times
E. Four times
F. Five or more times

During the school year, about how many hours a week do you work for pay?

A. None
B. About 1-5 hours
C. About 6-10 hours
D. About 11-15 hours
E. About 16-20 hours
F. About 21 hours or more

On the average, how many evenings a week during the school year do you usually go out for fun and recreation?

A. Less than one
B. One
C. Two
D. Three
E. Four or five
F. Six or seven

General Variables of the Student Information Inventory

The following variables constituted the scales of the Student Information Inventory whose scales are shown for all careers and occupations:

1. Socioeconomic Status
2. High School Courses Taken (Academic Oriented)
3. High School Grades
4. Amount of Extracurricular Reading
5. Study Habits and Attitudes

These scales are described more fully below:

P*801. Socioeconomic Index

A socioeconomic index was computed for each TALENT student on the basis of nine Student Information Blank items. See Appendix A, Part III.

F-803. High School Courses Taken (Academically Oriented)

This is the sum of several items weighted to give a scale oriented from academic to non-academic ends. See Appendix A, Part III.

P-820. High School Grades

This represents a weighted average of the student's reported high school grades.

F-830. Amount of Extracurricular Reading

This is based on the number of books (and of certain magazines) read.

P-827. Study Habits and Attitudes

This score is based on the number of hours per week spent studying and study habits. Research has shown that study habits are related to scholastic achievement. Here are a few of the questions asked:

- "For the following statements indicate how often each one applies to you . . . Mark one of the following choices for each statement:

  A. Almost always
  B. Most of the time
  C. About half the time
  D. Not very often
  E. Almost never

- "I make sure that I understand what I am to do before I start an assignment."
- "My teachers have criticized me for turning in a sloppy assignment."
- "When studying for a test, I am able to pick out important points to learn."

Occupationally Specific Variables of the Student Information Blank

The following variables constitute the scales of the Student Information Blank which are used occasionally in describing career and occupational characteristics:

1. Self-perception of Writing Skills
2. Self-perception of Reading Skills
3. Social Life
4. Work Activities

Each of these scales is described more fully below:

P-828. Self-Perception of Writing Skills

In this scale the student reports difficulty in expressing himself in writing, enjoyment of writing, difficulty with the mechanics of composition, and lowering of grades because of errors in spelling, grammar, and punctuation.

P-829. Self-Perception of Reading Skills

In this scale the student answers questions regarding reading speed, pronunciation of words to himself when reading, and difficulties in concentrating, understanding, and remembering.

F-837. Social Life

This score may give some indication of a youngster's social development. He is questioned concerning the age at which he began dating, frequency of dating, number of evenings out, and going steady.

F-838. Work Activities

This score indicates the amount of time worked during the school year and summer, including both paid employment and chores.

APPENDIX A

Part II

Percentile Ranks for TALENT Ability Tests in terms of the Percentile Ranks of the Differential Aptitude Test and the Flanagan Aptitude Classification Tests and in terms of raw subtest scores on the General Aptitude Test Battery

(Data adapted from Cureton, E. Project TALENT Tests as Anchors for Equating Other Tests. Palo Alto, Calif.: American Institutes for Research, 1973.)

TALENT TEST EQUIVALENTS OF DIFFERENTIAL APTITUDE TESTS*
(Third Edition, 1947, Form A)

To obtain equivalent percentile ranks for TALENT test:	To the percentile ranks for DAT test:	Add these tabled quantities in the DAT percentile rank range noted:						
		0-5	6-17	18-37	38-62	63-82	83-94	95-100
English Total	7II-Sentences							
Males		4	6	6	6	4	2	1
Females		3	9	8	5	2	1	0
Mechanical Reasoning	5-Mechanical Reasoning							
Males		3	6	6	5	2	1	0
Females		3	5	5	3	2	1	0
Visualization in 3-D	4-Space Relations							
Males		6	6	6	5	3	1	0
Females		5	4	2	-1	-4	-5	-5
Abstract Reasoning	3-Abstract Reasoning							
Males		3	4	5	1	-4	-4	-2
Females		2	3	2	1	-2	-3	-3
Arithmetic Computation	2-Numerical Ability							
Males		1	1	-3	-9	-13	-10	-4
Females		3	3	0	-6	-10	-9	-5

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*DAT percentiles are based on each sex norms separately. As an example of the use of this table, a DAT percentile rank of 72 on Space Relations is equivalent to a TALENT Visualization in 3-D percentile rank of 75 (=72+3) for a boy or 68 (=72-4) for a girl.

TALENT TEST EQUIVALENTS OF FLANAGAN APTITUDE CLASSIFICATION TESTS*
(1957 Edition)

To obtain equivalent percentile ranks for TALENT test:	to the percentile ranks for FACT test:	Add these tabled quantities in the FACT percentile rank range noted:						
		0-5	6-17	18-37	38-62	63-82	83-94	95-100
Reading Comprehension	7-Judgment and Comprehension							
Males		-1	-2	-1	5	4	3	2
Females		0	2	6	11	11	7	3
Creativity	11-Ingenuity							
Males		0	-3	-7	-9	-4	1	2
Females		5	4	1	1	1	1	0
Mechanical Reasoning	2-Mechanics*							
Males		-1	-6	-15	-21	-18	-6	-2
Females		-2	-1	10	22	20	9	4
Visualization in 3-D	6-Assembly							
Males		1	1	1	-3	-8	-4	-2
Females		3	4	8	10	6	2	0
Abstract Reasoning	12-Scales							
Males		-2	-6	-9	-7	-4	-1	0
Females		-1	-1	2	8	10	6	3
Arithmetic Reasoning	4-Reasoning							
Males		0	-2	-6	-10	-8	-6	-2
Females		3	4	4	3	2	2	1
Arithmetic Computation	10-Arithmetic							
Males		-1	-2	-3	-5	-6	-4	-3
Females		-1	-2	-2	-3	-2	0	1

*FACT percentiles are based on combined sex norms. As an example of the use of this table, a FACT percentile rank of 54 on Ingenuity is equivalent to a TALENT Creativity percentile rank of 45 (=54-9) for males and 55 (=54+1) for females.

PERCENTILE RANKS ON TALENT TESTS CORRESPONDING TO RAW SCORES ON GENERAL APTITUDE TEST BATTERY (GATB) SUBTESTS, FOR MALES IN EACH GRADE

GATB-2 (Computation) Raw Score	F-410 (Arithmetic Computation) Percentiles for Grades				GATB-3 (3-dim. space) Raw Score	R-282 (Vis. in 3-D) Percentiles for Grades				GATB-6 (Arithmetic Reasoning) Raw Score	R-311 (Arithmetic Reasoning) Percentiles for Grades			
	9th	10th	11th	12th		9th	10th	11th	12th		9th	10th	11th	12th
40	99	99	99	99	34	99	99	99	99	21	99	99	99	99
39	99	99	99	99	33	99	99	99	99	20	99	99	99	97
38	99	99	97	95	32	99	99	99	99	19	99	99	97	96
37	99	99	97	95	31	99	99	99	99	18	99	99	95	92
36	99	98	96	92	30	99	99	99	98	17	97	95	91	85
35	98	97	95	90	29	99	99	98	97	16	94	90	84	78
34	97	96	92	86	28	99	98	97	95	15	88	83	75	67
33	96	95	90	82	27	98	97	95	93	14	81	74	65	55
32	95	92	86	78	26	97	95	92	90	13	72	64	54	45
31	92	90	82	73	25	95	92	88	84	12	63	53	43	35
30	89	86	77	68	24	92	88	83	78	11	51	42	32	26
29	85	81	72	62	23	88	82	76	71	10	40	32	24	19
28	80	76	66	56	22	83	76	70	64	9	30	24	18	14
27	75	69	59	50	21	78	70	63	57	8	21	16	12	9
26	68	62	50	43	20	72	63	56	50	7	13	9	7	5
25	60	53	43	36	19	64	55	48	42	6	5	3	3	3
24	52	44	35	29	18	57	48	41	36	5	1	1	1	1
23	43	35	28	23	17	48	40	33	29	4	1	1	1	1
22	34	27	21	18	16	40	33	27	24					
21	27	19	16	13	15	34	27	23	19					
20	20	15	10	9	14	28	22	19	16					
19	16	10	8	6	13	22	17	15	12					
18	10	9	5	5	12	18	14	11	10					
17	9	6	4	4	11	14	10	9	8					
16	7	5	3	3	10	11	8	8	6					
15	5	4	3	2	9	9	7	6	5					
14	4	3	1	1	8	1	1	1	1					
13	1	1	1	1										
12	1	1	1	1										

PERCENTILE RANKS ON TALENT TESTS CORRESPONDING TO RAW SCORES ON GENERAL APTITUDE TEST BATTERY (GATB) SUBTESTS, FOR FEMALES IN EACH GRADE

GATB-2 (Computation) Raw Score	F-410 (Arithmetic Computation) Percentiles for Grades				GATB-3 (3-dim. space) Raw Score	R-282 (Vis. in 3-D) Percentiles for Grades				GATB-6 (Arithmetic Reasoning) Raw Score	R-311 (Arithmetic Reasoning) Percentiles for Grades			
	9th	10th	11th	12th		9th	10th	11th	12th		9th	10th	11th	12th
40	99	99	99	99	34	99	99	99	99	21	99	99	99	99
39	99	99	99	97	33	99	99	99	99	20	99	99	99	98
38	99	99	97	96	32	99	99	99	99	19	99	99	97	97
37	99	98	96	95	31	99	99	98	97	18	98	97	95	94
36	97	97	95	93	30	99	98	97	96	17	97	95	92	91
35	96	95	93	90	29	98	98	97	96	16	94	92	87	84
34	95	94	91	87	28	98	97	96	95	15	91	86	81	77
33	94	92	87	83	27	97	97	96	95	14	84	79	73	68
32	91	88	83	79	26	97	96	95	93	13	74	72	65	59
31	87	84	79	74	25	96	95	94	91	12	69	63	55	49
30	83	80	74	69	24	95	93	91	88	11	59	52	46	39
29	78	75	68	63	23	94	91	88	84	10	48	42	37	29
28	72	69	62	56	22	91	86	83	80	9	36	32	27	21
27	65	62	55	48	21	86	81	78	73	8	26	23	18	14
26	58	55	49	41	20	81	75	71	66	7	18	16	13	10
25	51	48	41	35	19	75	69	64	59	6	12	10	8	7
24	44	40	36	29	18	67	61	55	50	5	9	8	6	5
23	37	35	30	25	17	59	53	46	43	4	8	7	5	5
22	31	29	25	20	16	50	45	39	36					
21	26	25	20	17	15	43	38	32	29					
20	21	20	17	14	14	34	30	26	23					
19	18	17	14	11	13	29	26	21	19					
18	14	14	10	9	12	23	20	17	16					
17	10	10	7	6	11	19	17	14	14					
16	8	7	5	5	10	16	14	11	11					
15	6	5	4	4	9	12	10	8	8					
14	5	4	3	2	8	8	7	3	6					
13	4	3	1	1										
12	3	2	1	1										
11	1	1	1	1										
10	1	1	1	1										

WEIGHTED RAW SCORES AND PERCENTILE RANKS
FOR 12TH GRADE TALENT PARTICIPANTS
COMPARED WITH OPPOSITE SEX NORMS

			MALES Weighted				FEMALES Weighted		
			Mean	(1)*	S.D.		Mean	(2)**	S.D.
INTEREST									
P-701	Phy. Sci., Eng., Math.	M***	21.3	86.4	8.9		12.0	16.5	7.8
P-702	Bio. Sci., Med.		18.9	57.3	9.5		17.2	43.2	10.6
P-703	Public Service	M	18.8	72.2	11.9		12.2	32.9	11.1
P-704	Literary-Linguistic		16.7	29.5	8.5	F***	21.8	73.1	8.9
P-705	Social Service		16.7	13.3	7.6	F	24.8	84.6	7.2
P-706	Artistic		17.4	34.7	9.2	F	21.8	67.7	10.0
P-707	Musical		14.7	37.1	10.7	F	19.4	68.3	11.4
P-708	Sports	M	26.7	74.3	9.1		20.1	22.6	9.5
P-709	Hunting and Fishing	M	27.4	83.1	10.5		15.2	13.9	11.2
P-710	Business Management	M	20.9	68.4	7.5		17.0	28.6	7.6
P-711	Sales	M	17.8	65.0	9.0		14.5	35.8	8.9
P-712	Computation		17.4	53.0	8.6		16.8	48.0	9.0
P-713	Office Work		13.3	17.1	8.4	F	24.6	89.8	10.4
P-714	Mechanical-Technical	M	20.8	95.1	8.2		8.7	8.8	6.3
P-715	Skilled Trades	M	13.8	82.6	7.2		8.8	27.3	5.5
P-716	Farming	M	20.7	76.5	16.0		14.2	28.9	9.4
P-717	Labor	M	12.7	81.2	7.0		7.6	26.3	5.8
INFORMATION									
R-102	Vocabulary		13.9	58.4	3.8		12.7	34.9	4.0
R-103	Literature		13.9	50.5	4.7		13.9	49.9	4.8
R-104	Music		6.4	40.0	3.0		7.2	58.8	3.0
R-105	Social Studies		16.6	62.3	5.1		14.6	33.3	5.0
R-106	Mathematics	M	11.2	76.2	6.1		7.8	36.9	5.2
R-107	Physical Science	M	10.3	77.7	4.4		7.2	27.6	3.9
R-108	Biological Science		6.7	65.7	2.3		5.7	32.9	2.3
ABILITY									
R-230	Total English		82.1	25.0	14.5	F	88.2	65.2	12.9
R-250	Reading Comprehension		32.7	42.6	10.8		33.2	44.3	10.1
R-260	Creativity	M	10.2	59.9	4.3		9.1	40.2	3.9
R-270	Mechanical Reasoning	M	13.4	88.0	4.1		8.7	15.2	3.6
R-282	Visualization in 3-D		9.7	64.0	3.5		8.4	34.8	3.2
R-290	Abstract Reasoning		9.5	49.6	3.0		9.2	40.1	3.0
R-311	Arithmetic Reasoning		9.6	58.8	3.7		8.6	38.7	3.6
R-312	Introductory Math	M	12.2	71.2	5.7		10.1	41.6	4.8
F-410	Arithmetic Computation		30.5	35.3	21.8		32.9	46.6	18.4
OTHER									
P*801	Socioeconomic Status		98.9	52.2	9.9		98.4	47.8	9.7
F-803	H.S. Courses Taken (acad.)	M	41.9	64.8	17.1		37.0	42.6	15.5
P-820	H.S. Grades		23.9	42.9	9.1	F	26.7	64.9	9.4
F-830	Amt. of Extracurr. Reading		29.4	51.8	21.0	F	32.6	63.6	20.5
P-827	Study Habits & Attitudes		23.6	24.0	5.9	F	27.1	71.5	5.3

*Percentile rank of mean (male) score when compared to female norms.

**Percentile rank of mean (female) score when compared to male norms.

***Males scored significantly higher on variables followed by "M," and females scored significantly higher on variables showing an "F."

FEMALE PERCENTILES CORRESPONDING TO MALE PERCENTILES*

	Male Percentiles												
	1	5	10	20	30	40	50	60	70	80	90	95	99
INTEREST SCALES													
P701 Phys. Sci., Eng., Math.	5	25	39	59	71	80	86	91	95	97	99	99	99
P702 Bio. Sci., Medicine	2	8	16	30	41	51	59	67	74	82	90	95	99
P703 Public Service	2	9	19	39	52	62	71	79	85	90	96	98	99
P704 Literary-Linguistic	1	1	4	9	15	21	29	37	46	57	72	83	95
P705 Social Service	1	1	1	3	5	8	13	19	27	39	57	72	91
P706 Artistic	1	2	6	12	19	26	34	43	52	64	77	86	96
P707 Musical	1	2	5	11	18	26	34	43	53	65	80	89	98
P708 Sports	2	13	27	46	61	71	79	85	90	94	97	98	99
P709 Hunting & Fishing	7	31	45	64	74	81	87	91	94	96	98	99	99
P710 Business Management	2	11	21	37	49	60	69	77	84	90	96	98	99
P711 Sales	2	9	18	32	44	55	64	73	81	88	94	97	99
P712 Computation	1	4	10	22	33	42	52	61	70	80	89	95	99
P713 Office Work	1	1	2	4	8	11	14	18	23	31	45	59	83
P714 Mechanical-Technical	10	41	61	79	88	93	96	98	99	99	99	99	99
P715 Skilled Trades	1	6	18	45	62	74	82	88	92	96	98	99	99
P716 Farming	3	14	27	46	60	70	78	84	89	94	97	99	99
P717 Labor	3	14	27	47	61	71	79	85	90	94	97	98	99
INFORMATION TEST													
R102 Vocabulary	1	8	16	31	43	54	63	71	79	87	93	97	99
R103 Literature	1	4	9	20	30	41	52	62	72	82	91	95	99
R104 Music	1	4	7	14	22	31	40	51	62	73	86	93	98
R105 Social Studies	1	6	14	28	42	54	66	75	84	91	96	98	99
R106 Mathematics	2	9	17	31	44	54	64	73	81	89	95	98	99
R107 Physical Science	3	13	22	39	53	63	73	81	87	93	98	99	99
R108 Biological Science	1	8	16	31	44	56	66	76	83	90	95	98	99
ABILITY TEST													
R230 Total English	1	2	4	10	15	22	30	39	49	62	78	88	97
R250 Reading Comprehension	1	3	6	15	26	36	48	58	68	79	90	95	99
R260 Creativity	1	5	11	23	35	46	57	67	77	86	95	98	99
R270 Mechanical Reasoning	2	18	34	56	71	81	87	92	95	98	99	99	99
R282 Visualization in 3D	1	6	12	26	40	53	64	74	83	91	96	98	99
R290 Abstract Reasoning	1	5	11	22	33	43	53	63	72	82	92	96	99
R311 Arithmetic Reasoning	1	6	13	25	37	48	57	67	76	85	94	97	99
R312 Introductory Math	1	6	11	22	34	46	57	67	77	85	94	97	99
F410 Arithmetic Computation	1	3	7	15	23	31	40	50	61	72	85	93	98
OTHER VARIABLES													
P*801 Socioeconomic Status	1	5	10	20	31	41	52	62	71	81	91	96	99
F803 H.S. Courses Taken (Aca.)	1	5	11	25	40	51	61	70	79	88	95	98	99
P820 H.S. Grades	1	3	6	14	22	31	42	52	62	74	86	92	98
F830 Amt. of Extracur. Reading	1	3	6	15	25	35	45	55	66	77	89	95	99
P827 Study Habits & Attitudes	1	2	4	8	13	20	27	36	48	62	78	89	97

*The table entry is the female percentile corresponding to the male percentile at the head of the column. For example, a boy with a percentile score of 70 on Reading Comprehension relative to males has a percentile score of 68 relative to female norms.

MALE PERCENTILES CORRESPONDING TO FEMALE PERCENTILES*

	Female Percentiles												
	1	5	10	20	30	40	50	60	70	80	90	95	99
INTEREST SCALES													
P701 Phys. Sci., Eng., Math.	1	1	2	4	7	10	15	21	29	40	57	70	89
P702 Bio. Sci., Medicine	1	3	6	12	20	29	39	51	64	77	90	95	99
P703 Public Service	1	3	5	11	15	21	28	38	48	62	79	89	98
P704 Literary-Linguistic	4	13	22	38	52	64	74	82	89	94	97	99	99
P705 Social Service	11	30	44	61	73	81	87	91	94	97	99	99	99
P706 Artistic	2	9	18	32	45	57	67	77	85	91	97	99	99
P707 Musical	2	10	18	32	45	57	68	76	84	90	95	98	99
P708 Sports	1	2	4	7	11	17	22	29	39	51	71	84	97
P709 Hunting & Fishing	1	1	2	3	5	8	12	17	26	38	59	75	94
P710 Business Management	1	3	5	10	15	22	30	40	51	64	79	89	97
P711 Sales	1	3	6	12	18	26	35	45	57	69	83	91	98
P712 Computation	2	6	10	18	27	37	48	59	70	81	91	95	99
P713 Office Work	5	22	38	64	79	87	92	95	97	99	99	99	99
P714 Mechanical-Technical	1	1	1	2	3	5	7	10	14	21	34	47	75
P715 Skilled Trades	2	5	7	11	14	18	22	28	36	48	65	78	94
P716 Farming	1	2	4	7	11	16	23	31	41	54	71	83	96
P717 Labor	1	2	4	7	11	16	22	29	39	52	70	83	97
INFORMATION TEST													
R102 Vocabulary	1	4	7	13	19	27	36	46	58	71	85	92	98
R103 Literature	1	6	11	21	30	39	48	58	68	78	89	95	99
R104 Music	2	7	14	27	38	49	59	69	77	85	93	97	99
R105 Social Studies	1	4	8	15	21	28	36	45	54	65	79	88	97
R106 Mathematics	1	3	6	12	20	27	36	46	56	67	80	88	97
R107 Physical Science	1	2	4	9	14	21	28	37	47	59	74	83	93
R108 Biological Science	1	3	7	13	19	27	35	44	54	65	81	89	97
ABILITY TEST													
R230 Total English	2	12	21	37	50	62	71	78	85	91	96	98	99
R250 Reading Comprehension	2	8	15	25	34	43	52	62	72	81	90	95	99
R260 Creativity	1	5	9	17	26	35	44	53	62	73	84	90	97
R270 Mechanical Reasoning	1	2	3	6	9	13	17	22	29	39	54	68	87
R282 Visualization in 3D	1	5	8	16	23	30	37	46	55	66	79	88	97
R290 Abstract Reasoning	1	5	9	18	28	37	47	57	67	78	88	94	99
R311 Arithmetic Reasoning	1	4	8	16	24	33	42	53	63	74	85	92	98
R312 Introductory Math	1	5	10	19	27	36	44	53	62	72	85	91	98
F410 Arithmetic Computation	2	8	14	27	39	50	59	69	78	86	93	96	99
OTHER VARIABLES													
P*801 Socioeconomic Status	1	5	10	20	29	39	48	58	68	79	89	94	99
F803 H.S. Courses Taken (Aca.)	1	5	9	16	23	31	39	49	60	71	83	90	97
P820 H.S. Grades	2	8	15	28	3[illegible]	49	58	68	77	85	93	97	99
F830 Amt. of Extracur. Reading	2	9	15	25	36	46	55	65	74	83	91	95	99
P827 Study Habits & Attitudes	3	13	24	40	53	63	72	79	85	91	95	98	99

*The table entry is the male percentile corresponding to the female percentile at the head of the column. For example, a girl with a percentile score of 70 on Reading Comprehension relative to females has a percentile score of 72 relative to male norms.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 1

	Occupation																															
	A		B		C		D		E		F		G		H		I		J		K		m		N		O		P		R	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	190	*	269	*	651	*	108	*	157	*	284	*	713	*	418	*	58	*	140	*	81	*	160	164	49	*	169	*	178	73	166	*
INTEREST SCALES																																
P701 Phys. Sci., Eng., Math	71		84		82		86		89		79		84		83		82		81		82		77	86	78		91		83	93	69	
P702 Bio. Sci., Medicine	61		71		62		63		71		60		61		59		62		61		68		63	64	63		68		81	85	72	
P703 Public Service	48		49		50		48		55		46		47		50		41		56		50		55	66	42		45		53	65	51	
P704 Literary-Linguistic	57		57		50		53		57		48		50		48		48		62		76		57	63	53		58		71	75	55	
P705 Social Service	44		45		46		41		52		38		42		45		42		52		61		69	68	53		48		66	52	61	
P706 Artistic	83		48		56		61		56		55		53		57		59		54		58		51	58	63		58		57	67	53	
P707 Musical	66		53		53		53		47		49		54		51		59		61		69		55	61	56		62		68	66	56	
P708 Sports	47		45		48		44		47		48		36		46		37		38		35		55	59	43		34		47	59	49	
P709 Hunting & Fishing	36		38		37		36		37		46		36		44		45		28		28		36	53	35		34		45	66	43	
P710 Business Management	45		36		45		39		44		44		38		43		34		44		35		52	53	36		35		35	50	39	
P711 Sales	45		41		42		35		39		41		37		37		37		45		38		46	52	32		33		41	45	45	
P712 Computation	50		57		61		63		57		53		58		57		49		69		68		71	79	62		63		55	57	51	
P713 Office Work	47		47		47		47		51		45		48		48		43		55		48		59	38	53		48		51	21	51	
P714 Mechanical-Technical	43		47		56		56		51		51		61		67		46		41		33		44	73	47		51		44	76	43	
P715 Skilled Trades	33		34		37		39		37		39		38		46		35		29		27		40	58	35		30		33	51	36	
P716 Farming	40		41		40		42		43		50		39		44		51		30		25		44	59	40		33		41	72	50	
P717 Labor	30		32		37		32		31		39		35		42		33		27		28		42	54	47		25		31	47	37	
INFORMATION TEST																																
R102 Vocabulary	76		81		78		74		85		73		79		79		73		79		83		65	84	78		81		83	92	77	
R103 Literature	76		80		75		74		82		72		74		71		79		79		87		66	80	85		82		84	94	70	
R104 Music	76		74		73		70		76		67		71		72		73		77		85		62	74	73		77		84	85	67	
R105 Social Studies	72		79		76		74		80		72		74		73		78		77		87		68	81	77		81		84	93	68	
R106 Mathematics	81		87		85		86		90		83		86		85		82		92		94		83	92	89		92		90	95	78	
R107 Physical Science	74		85		82		82		88		78		84		81		85		86		88		75	86	89		90		89	96	79	
R108 Biological Science	71		80		70		70		80		68		73		71		75		72		76		59	74	83		80		82	90	76	
ABILITY TEST																																
R230 Total English	75		80		77		79		86		76		77		77		72		86		93		76	82	82		86		87	91	76	
R250 Reading Comprehension	72		78		76		71		84		70		74		72		75		79		87		64	78	78		86		81	92	70	
R260 Creativity	78		75		77		79		77		73		77		76		78		75		78		62	78	78		80		82	90	71	
R270 Mechanical Reasoning	74		75		76		80		77		74		79		78		79		68		70		60	84	77		87		74	89	69	
R282 Visualization in 3D	82		70		75		79		76		73		76		78		78		72		76		61	83	80		81		73	86	68	
R290 Abstract Reasoning	76		76		78		80		79		75		77		78		71		80		82		69	82	71		83		74	85	71	
R311 Arithmetic Reasoning	73		80		81		78		84		76		79		81		77		83		89		77	88	75		89		81	90	71	
R312 Introductory Math	80		86		87		86		90		85		87		85		80		90		95		84	94	85		92		87	95	76	
F410 Arithmetic Computation	63		73		76		73		82		73		69		73		64		79		82		79	83	66		77		67	78	55	
OTHER VARIABLES																																
P*801 Socioeconomic Status	79		69		70		71		70		69		65		65		78		68		76		55	72	75		76		77	83	65	
F803 H.S. Courses Taken (Aca.)	76		80		76		75		83		74		74		74		76		78		88		73	80	74		81		80	87	69	
P820 H.S. Grades	69		80		81		72		86		75		76		74		60		86		93		80	87	81		88		87	92	71	
F830 Amt. of Extracur. Reading	60		67		61		67		67		59		64		61		70		68		71		53	65	74		76		77	81	61	
P827 Study Habits & Attitudes	71		80		74		72		84		71		73		73		76		80		84		75	79	76		81		83	88	74	

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 2

	Occupation															
Sex	A		B		C		d		E		F		G		H	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	96	*	124	*	260	*	*	2260	254	59	591	*	76	*	137	*
INTEREST SCALES																
P701 Phys. Sci., Eng., Math.	55		68		70			70	69	90	76		65		53	
P702 Bio. Sci., Medicine	53		77		83			82	77	84	89		70		63	
P703 Public Service	45		48		62			58	54	68	63		50		42	
P704 Literary-Linguistic	40		53		59			52	57	60	72		43		44	
P705 Social Service	49		49		59			59	55	44	61		45		47	
P706 Artistic	43		59		59			51	52	57	57		33		47	
P707 Musical	45		57		55			57	57	61	67		35		49	
P708 Sports	49		47		51			58	45	66	46		52		44	
P709 Hunting & Fishing	61		59		39			60	40	61	36		61		71	
P710 Business Management	39		37		51			42	47	55	44		35		33	
P711 Sales	40		37		47			42	46	49	41		37		37	
P712 Computation	48		43		55			42	59	54	54		43		41	
P713 Office Work	45		46		48			26	51	23	41		40		47	
P714 Mechanical-Technical	44		43		35			60	39	68	29		42		40	
P715 Skilled Trades	46		38		32			54	34	46	25		40		47	
P716 Farming	81		55		40			62	38	57	34		67		74	
P717 Labor	46		36		29			53	35	47	22		32		43	
INFORMATION TEST																
R102 Vocabulary	64		76		78			75	52	86	87		74		68	
R103 Literature	59		78		78			74	69	83	86		71		69	
R104 Music	57		73		73			70	69	85	83		67		59	
R105 Social Studies	66		70		74			74	69	84	83		72		70	
R106 Mathematics	68		78		84			79	77	92	89		80		75	
R107 Physical Science	70		79		78			76	75	87	86		82		73	
R108 Biological Science	71		79		75			72	66	81	79		77		77	
ABILITY TEST																
R230 Total English	66		78		81			71	73	84	88		76		71	
R250 Reading Comprehension	64		73		72			71	66	80	84		75		67	
R260 Creativity	61		76		73			70	65	80	77		74		65	
R270 Mechanical Reasoning	68		67		69			70	57	82	70		72		72	
R282 Visualization in 3D	53		68		71			66	58	77	68		62		64	
R290 Abstract Reasoning	62		68		73			66	62	70	76		75		71	
R311 Arithmetic Reasoning	73		71		77			72	72	82	83		80		69	
R312 Introductory Math	70		78		82			78	76	91	89		84		76	
F410 Arithmetic Computation	60		59		73			64	72	75	82		69		64	
OTHER VARIABLES																
P*801 Socioeconomic Status	64		71		78			65	66	74	86		75		61	
F803 H.S. Courses Taken (Aca.)	50		77		82			74	74	82	88		68		64	
P820 H.S. Grades	67		67		83			71	73	87	90		81		63	
F830 Amt. of Extracur. Reading	60		66		58			66	58	76	71		49		66	
P827 Study Habits & Attitudes	69		71		83			69	72	80	86		74		63	

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 3

Occupation	A		B		C		D		E		F		G		H		I		J		K		L		M		N		r		S		t	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	721	228	120	*	1582	109	728	*	341	*	178	*	400	108	42	*	235	*	571	61	295	*	259	89	440	*	103	*	*	87	69	*	48	173
INTEREST SCALES																																		
P701 Phys. Sci., Eng., Math.	49	58	48		57	64	58		69		35		50	58	64		63		52	60	74		53	68	63		55			60	64		45	57
P702 Bio. Sci., Medicine	44	45	57		57	53	50		55		41		51	48	61		57		51	59	64		60	62	58		53			52	64		44	47
P703 Public Service	52	56	55		56	67	58		59		50		54	62	62		54		56	66	59		58	61	49		51			62	69		53	58
P704 Literary-Linguistic	47	46	66		54	55	50		54		48		51	53	59		52		53	54	61		56	65	51		45			52	73		65	53
P705 Social Service	50	39	52		51	44	51		51		50		49	50	48		49		51	37	55		55	48	46		55			32	49		67	54
P706 Artistic	46	49	68		51	54	45		53		45		51	51	54		53		49	60	57		49	59	48		44			62	63		46	50
P707 Musical	48	51	59		51	50	49		49		52		52	52	54		49		50	55	60		53	61	54		47			50	50		64	55
P708 Sports	46	47	46		46	52	48		53		42		47	53	45		47		47	47	52		55	56	47		46			50	44		47	54
P709 Hunting & Fishing	36	54	35		39	53	36		39		36		45	50	36		45		37	58	46		37	55	46		39			52	45		27	53
P710 Business Management	55	53	53		56	59	54		53		52		56	56	61		53		58	57	50		59	53	43		58			48	69		58	60
P711 Sales	56	53	62		56	56	55		54		56		54	53	63		51		58	50	41		52	51	40		60			55	62		53	60
P712 Computation	74	71	39		57	56	79		60		59		50	59	58		55		57	45	52		54	50	47		60			40	55		63	71
P713 Office Work	63	47	47		51	38	62		50		59		50	53	39		50		56	27	48		50	32	46		61			26	46		64	52
P714 Mechanical-Technical	38	53	23		43	59	36		52		44		42	59	34		50		42	54	43		32	61	45		49			52	33		34	54
P715 Skilled Trades	41	53	31		41	56	37		40		48		45	59	28		39		41	52	37		34	48	38		47			50	33		37	56
P716 Farming	40	57	33		43	57	40		41		45		45	53	36		45		42	50	47		40	59	47		51			52	44		44	53
P717 Labor	45	54	35		43	52	41		39		48		47	59	26		40		41	49	38		40	45	38		48			50	32		45	55
INFORMATION TEST																																		
R102 Vocabulary	50	55	63		65	62	60		68		42		51	46	79		68		57	70	76		67	78	70		46			68	66		55	64
R103 Literature	57	63	80		66	70	66		69		51		61	52	76		70		64	74	79		68	78	69		61			70	75		58	62
R104 Music	55	58	77		66	69	67		67		55		56	48	73		67		63	71	76		70	78	67		58			68	73		60	60
R105 Social Studies	60	65	68		63	68	66		67		52		53	53	74		68		63	77	78		68	79	69		51			70	72		56	64
R106 Mathematics	65	68	76		67	70	75		74		53		58	58	81		72		68	82	83		71	81	73		61			72	70		61	73
R107 Physical Science	58	63	67		63	65	63		70		48		55	53	71		71		60	73	78		67	82	72		54			69	62		56	67
R108 Biological Science	50	58	62		59	64	56		65		42		51	45	62		63		55	59	74		57	70	69		49			62	58		61	60
ABILITY TEST																																		
R230 Total English	63	57	69		66	58	72		69		57		53	50	76		71		64	66	78		72	75	66		60			62	69		61	66
R250 Reading Comprehension	55	59	73		61	64	68		67		49		53	49	72		67		59	66	74		64	74	66		57			62	68		63	62
R260 Creativity	56	56	67		64	65	65		67		55		54	48	62		69		61	69	77		67	73	72		55			73	62		55	64
R270 Mechanical Reasoning	47	64	49		56	68	53		64		44		48	48	54		67		52	71	72		55	72	73		51			70	50		50	62
R282 Visualization in 3D	52	65	46		56	66	59		61		50		47	54	56		59		53	65	70		54	72	68		49			66	56		42	61
R290 Abstract Reasoning	53	60	68		61	55	64		64		46		50	42	70		62		58	66	71		57	68	68		53			64	61		56	62
R311 Arithmetic Reasoning	65	68	65		64	67	71		69		54		58	51	79		70		62	73	76		66	75	69		54			67	66		63	70
R312 Introductory Math	67	70	67		68	67	77		74		55		60	54	83		72		65	77	81		69	79	72		62			72	69		68	72
F410 Arithmetic Computation	66	62	58		62	48	75		62		52		48	40	75		60		57	71	72		65	61	58		56			58	66		64	59
OTHER VARIABLES																																		
P*801 Socioeconomic Status	55	54	77		67	63	63		67		49		62	48	76		72		69	80	72		70	79	71		58			80	78		46	64
F803 H.S. Courses Taken (Aca.)	59	58	65		63	63	65		69		50		57	54	76		65		61	69	74		66	76	65		57			69	69		57	60
P820 H.S. Grades	58	61	59		62	58	65		68		50		57	51	81		66		57	62	72		61	73	63		42			62	64		56	71
F830 Amt. of Extracur. Reading	50	65	66		59	61	58		63		56		60	55	59		63		60	65	68		61	69	64		52			64	55		50	58
P827 Study Habits & Attitudes	61	56	65		61	54	64		68		42		57	48	70		68		58	57	73		70	72	64		59			62	63		68	66

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 4

	Occupation																					
	A		b		d		e		f		g		h		i		j		k		l	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	508	*	*	60	98	162	191	758	1506	5131	135	2183	250	288	*	116	42	257	*	231	164	171
INTEREST SCALES																						
P701 Phys. Sci., Eng., Math.	45			72	53	71	53	68	53	66	45	63	54	68		64	44	64		60	44	66
P702 Bio. Sci., Medicine	56			66	63	68	64	64	61	62	55	60	60	62		63	63	68		56	52	62
P703 Public Service	52			70	58	70	61	68	55	64	46	60	62	66		58	67	64		56	49	56
P704 Literary-Linguistic	73			74	74	71	73	68	61	64	56	60	61	70		64	79	64		55	49	50
P705 Social Service	85			58	72	63	73	59	68	62	73	66	68	58		60	86	66		58	66	57
P706 Artistic	55			63	60	62	63	61	53	60	50	56	53	61		64	70	60		60	48	50
P707 Musical	68			64	61	64	67	60	57	60	61	61	59	61		63	75	60		61	51	54
P708 Sports	41			54	48	60	48	57	52	57	55	54	54	57		56	58	54		49	76	86
P709 Hunting & Fishing	34			58	34	60	36	54	36	56	36	56	39	56		59	35	58		53	46	72
P710 Business Management	45			63	58	64	57	54	48	54	48	52	54	54		51	62	50		50	49	46
P711 Sales	45			50	60	54	54	54	48	54	54	54	48	50		54	65	49		51	54	42
P712 Computation	51			42	59	50	55	44	54	50	50	50	53	46		44	53	46		53	50	45
P713 Office Work	59			23	58	24	54	25	51	34	54	36	51	28		28	59	28		38	50	28
P714 Mechanical-Technical	28			60	33	58	35	58	36	58	33	56	35	58		60	21	56		58	37	60
P715 Skilled Trades	34			52	36	49	36	52	38	56	38	56	40	55		62	32	53		64	49	55
P716 Farming	43			54	40	60	41	57	43	59	44	60	48	60		63	41	57		60	54	70
17 Labor	38			41	37	52	39	52	40	52	39	52	44	50		52	36	50		58	50	54
INFORMATION TEST																						
R102 Vocabulary	71			82	56	80	66	76	60	76	58	70	64	78		73	68	74		70	48	66
R103 Literature	75			80	70	82	70	78	68	76	63	73	68	80		76	77	76		69	58	68
R104 Music	72			73	72	80	72	76	69	74	68	72	68	76		76	78	72		68	62	68
R105 Social Studies	71			74	64	77	68	77	66	76	63	72	67	81		77	77	74		72	55	71
R106 Mathematics	73			85	71	86	69	81	70	82	65	78	72	82		80	74	80		76	60	75
R107 Physical Science	66			74	63	80	63	76	66	76	62	72	67	80		72	70	73		76	54	73
R108 Biological Science	60			70	56	76	58	70	61	70	58	67	61	76		73	67	71		68	49	68
ABILITY TEST																						
R230 Total English	80			76	76	79	67	73	68	74	63	70	70	78		67	75	70		65	57	60
R250 Reading Comprehension	72			82	63	76	67	72	65	72	61	68	68	77		70	73	71		65	55	63
R260 Creativity	67			74	62	79	60	69	63	70	60	68	60	71		67	62	70		65	53	61
R270 Mechanical Reasoning	52			65	50	72	48	66	52	68	46	66	56	71		64	44	70		68	45	70
R282 Visualization in 3D	57			54	55	66	53	63	54	66	53	63	51	69		67	55	68		74	49	66
R290 Abstract Reasoning	65			63	55	69	58	64	56	66	55	66	64	68		66	63	66		68	53	66
R311 Arithmetic Reasoning	68			78	66	76	61	72	62	72	57	70	67	76		68	64	72		68	55	62
R312 Introductory Math	71			83	67	83	66	79	68	80	65	76	71	82		78	71	78		76	62	72
F410 Arithmetic Computation	62			66	67	70	47	56	62	66	56	60	60	66		54	67	58		64	51	57
OTHER VARIABLES																						
P*801 Socioeconomic Status	66			82	68	81	64	76	64	73	50	72	63	72		76	63	80		70	56	70
F803 H.S: Courses Taken (Aca.)	68			76	66	79	66	75	65	74	63	74	65	74		76	69	76		68	60	72
P820 H.S. Grades	75			76	72	80	62	70	67	76	60	69	65	80		66	59	66		76	55	67
F830 Amt. of Extracur. Reading	68			71	65	68	69	68	64	65	57	64	61	68		66	70	68		62	50	57
P827 Study Habits & Attitudes	80			75	69	72	65	64	68	70	64	66	69	74		62	78	67		69	53	64

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 5

	Occupation																													
	A		B		C		D		e		F		G		H		i		j		k		l		M		N		r	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	71	*	84	*	126	82	1110	60	*	293	294	182	85	*	571	447	132	140	115	465	*	68	*	172	234	79	254	184	75	99
INTEREST SCALES																														
P701 Phys. Sci., Eng., Math.	47		69		44	63	62	82		70	63	79	64		60	79	58	74	38	66		72		66	58	79	53	70	54	66
P702 Bio. Sci., Medicine	61		63		46	59	66	68		58	74	76	63		65	74	62	68	61	64		64		57	67	74	57	65	64	54
P703 Public Service	67		63		69	71	76	83		63	53	67	66		63	73	57	74	49	66		64		62	71	78	61	73	46	66
P704 Literary-Linguistic	76		64		79	84	76	80		72	70	72	66		78	79	87	88	77	78		80		68	82	78	68	73	77	82
P705 Social Service	53		49		57	42	59	49		53	58	50	62		69	58	66	58	66	60		52		55	67	58	71	59	61	42
P706 Artistic	57		58		59	68	55	69		64	59	65	53		68	72	71	79	66	65		70		58	57	65	55	65	69	76
P707 Musical	56		53		65	64	59	69		66	71	65	55		72	73	71	73	73	67		75		61	68	67	58	62	67	71
P708 Sports	39		46		44	57	49	63		49	46	60	47		43	60	36	60	35	53		50		52	38	53	49	59	35	54
P709 Hunting & Fishing	32		45		27	60	36	58		53	36	55	40		36	59	27	55	27	56		56		56	34	57	37	54	36	57
P710 Business Management	48		57		42	58	63	65		50	43	51	49		50	55	47	60	34	54		42		46	55	53	56	57	35	45
P711 Sales	45		49		43	52	58	55		51	46	48	49		45	52	44	60	40	53		44		44	53	44	54	55	44	52
P712 Computation	41		58		44	40	57	50		48	47	44	57		54	45	42	40	46	40		44		44	50	40	51	45	39	31
P713 Office Work	39		45		50	28	46	19		28	42	19	50		50	20	40	18	50	25		16		26	44	16	51	24	49	20
P714 Mechanical-Technical	23		33		26	53	24	63		60	29	59	36		28	62	21	58	23	56		58		56	22	57	35	61	29	58
P715 Skilled Trades	23		30		32	44	23	41		56	27	43	33		30	54	21	46	30	50		43		50	23	42	36	52	35	46
P716 Farming	40		41		31	65	32	63		60	31	57	40		37	60	30	57	31	56		60		54	34	60	52	59	37	64
P717 Labor	24		30		36	50	26	45		54	25	44	33		31	49	23	48	28	52		44		47	25	45	42	53	38	48
INFORMATION TEST																														
R102 Vocabulary	74		75		76	83	78	85		84	78	84	63		81	85	87	91	78	81		88		82	83	91	67	77	72	86
R103 Literature	85		77		80	85	34	91		85	83	88	76		82	87	93	92	83	85		91		86	88	92	73	85	82	88
R104 Music	80		73		76	80	80	87		80	80	84	77		82	85	89	88	81	80		88		79	82	85	71	78	77	79
R105 Social Studies	86		78		76	82	80	88		85	72	83	73		79	84	82	88	70	82		90		88	87	93	74	83	75	83
R106 Mathematics	83		79		71	82	84	93		84	79	90	76		81	89	84	91	73	84		92		88	83	92	65	82	70	82
R107 Physical Science	75		74		67	77	76	86		80	77	84	71		78	83	82	86	73	80		86		82	78	88	65	77	72	84
R108 Biological Science	71		67		60	73	67	80		76	70	78	63		74	79	74	85	63	76		79		73	72	85	62	71	65	82
ABILITY TEST																														
R230 Total English	83		72		82	84	85	82		82	80	84	75		86	82	92	92	81	84		90		86	84	87	68	71	79	80
R250 Reading Comprehension	78		74		76	83	82	85		80	79	85	71		79	83	84	92	77	82		86		83	84	87	66	77	79	82
R260 Creativity	[illegible]		62		70	74	75	83		70	75	78	72		76	79	79	81	72	76		82		72	75	79	62	67	69	78
R270 Mechanical Reasoning	54		60		47	70	61	77		68	57	77	51		63	77	60	80	56	71		81		72	55	75	46	65	57	74
R282 Visualization in 3D	59		58		53	64	61	78		66	60	71	52		65	76	59	74	58	68		71		70	62	74	49	60	49	67
R290 Abstract Reasoning	64		66		58	67	70	81		69	73	78	68		75	75	77	76	66	72		83		75	70	76	54	62	67	63
R311 Arithmetic Reasoning	73		73		67	76	79	84		76	72	82	68		77	81	79	87	66	78		88		80	79	86	61	71	63	78
R312 Introductory Math	77		78		70	83	84	88		84	79	87	80		81	86	83	90	71	82		90		88	80	89	64	78	67	82
F410 Arithmetic Computation	70		67		61	67	73	69		60	62	69	61		70	66	76	74	58	66		75		63	71	81	59	60	54	54
OTHER VARIABLES																														
P*801 Socioeconomic Status	77		76		69	79	84	87		76	74	82	70		75	82	80	86	67	74		84		79	77	84	63	75	70	78
F803 H.S. Courses Taken (Aca.)	76		79		69	73	80	81		74	78	80	71		74	80	77	86	76	77		86		78	79	84	63	79	68	74
P820 H.S. Grades	82		75		63	75	78	84		80	73	81	69		81	81	86	88	65	78		86		82	81	88	63	73	56	77
F830 Amt. of Extracur. Reading	71		65		69	77	71	81		78	70	75	60		71	76	75	80	68	72		76		68	77	81	66	74	75	76
P827 Study Habits & Attitudes	74		73		63	74	77	75		76	74	75	69		77	75	82	78	73	72		80		76	80	83	67	71	60	64

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 6

	Occupation											
	a		B		C		d		e		F	
Sex	M	F	M	F	M	F	M	F	M	F	M	F
Number =	59	151	143	136	63	*	47	167	102	223	73	*
INTEREST SCALES												
P701 Phys. Sci., Eng., Math.	34	60	45	60	36		43	60	41	64	49	
P702 Bio. Sci., Medicine	44	56	45	59	45		48	57	53	62	62	
P703 Public Service	52	58	45	56	38		40	58	48	60	58	
P704 Literary-Linguistic	70	60	66	59	60		66	67	71	68	75	
P705 Social Service	41	30	51	35	52		52	50	69	63	57	
P706 Artistic	90	85	92	88	58		93	91	68	66	74	
P707 Musical	66	60	70	61	93		72	66	95	92	72	
P708 Sports	33	46	41	54	28		41	56	28	51	38	
P709 Hunting & Fishing	36	57	46	69	19		40	62	27	59	45	
P710 Business Management	33	39	39	46	25		28	46	42	48	53	
P711 Sales	37	45	43	52	31		40	54	46	50	54	
P712 Computation	31	36	34	32	39		38	36	47	44	41	
P713 Office Work	34	18	48	24	48		44	21	61	32	49	
P714 Mechanical-Technical	28	57	38	60	27		25	52	25	56	43	
P715 Skilled Trades	34	51	44	63	27		35	57	31	58	41	
P716 Farming	31	63	45	72	30		40	64	31	58	45	
P717 Labor	34	46	38	55	33		37	43	35	56	38	
INFORMATION TEST												
R102 Vocabulary	64	74	49	68	67		65	80	72	74	77	
R103 Literature	71	79	65	73	67		69	82	69	74	81	
R104 Music	70	75	62	71	88		66	78	88	88	82	
R105 Social Studies	60	76	51	71	57		59	78	59	72	66	
R106 Mathematics	60	78	55	72	67		58	81	70	80	67	
R107 Physical Science	63	78	54	72	61		63	77	64	76	71	
R108 Biological Science	59	74	58	73	61		59	78	66	71	60	
ABILITY TEST												
R230 Total English	69	68	56	64	71		52	74	75	78	74	
R250 Reading Comprehension	65	73	52	69	59		63	73	62	72	74	
R260 Creativity	63	74	55	71	60		62	76	60	69	78	
R270 Mechanical Reasoning	58	78	55	78	50		59	80	49	70	76	
R282 Visualization in 3D	67	80	67	75	53		66	76	53	68	69	
R290 Abstract Reasoning	63	70	58	71	55		57	74	62	70	69	
R311 Arithmetic Reasoning	58	71	47	64	60		55	71	59	74	69	
R312 Introductory Math	55	74	51	64	64		56	79	64	80	66	
F410 Arithmetic Computation	36	44	36	40	44		41	64	55	68	51	
OTHER VARIABLES												
P*801 Socioeconomic Status	65	78	55	72	66		55	78	62	74	77	
F803 H.S. Courses Taken (Aca.)	57	70	54	69	60		60	75	61	70	65	
P820 H.S. Grades	40	64	51	57	60		55	70	63	76	52	
F830 Amt. of Extracur. Reading	66	68	58	62	60		67	66	62	64	73	
P827 Study Habits & Attitudes	54	56	56	56	58		52	66	64	68	64	

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 7

	Occupation																											
	A		B		C		d		E		F		G		h		I		J		k		m		N		r	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	263	203	467	231	114	*	*	100	406	*	720	*	325	*	90	441	262	79	122	*	*	66	*	70	70	*	51	302
INTEREST SCALES																												
P701 Phys. Sci., Eng., Math.	50	56	62	85	60			72	54		64		64		58	69	56	76	54			70		76	46		54	83
P702 Bio. Sci., Medicine	43	53	54	62	46			76	42		45		52		64	72	51	75	58			76		72	42		70	82
P703 Public Service	49	58	47	64	41			59	41		42		42		40	58	54	62	44			56		64	41		48	61
P704 Literary-Linguistic	45	47	50	52	39			50	40		43		42		51	50	50	57	51			50		72	38		55	55
P705 Social Service	47	46	49	45	36			60	43		42		43		54	50	50	42	43			44		60	34		57	52
P706 Artistic	48	46	49	53	47			59	64		48		53		54	54	49	60	69			59		68	46		53	58
P707 Musical	53	49	55	57	55			57	49		49		53		56	50	50	55	67			56		67	41		52	57
P708 Sports	45	52	45	55	40			56	42		35		40		46	56	47	56	37			72		64	39		41	59
P709 Hunting & Fishing	36	54	36	55	43			58	47		45		46		37	58	46	59	45			67		58	45		36	60
P710 Business Management	49	50	42	52	36			56	40		34		38		46	46	47	52	34			40		58	37		41	48
P711 Sales	47	50	40	50	40			56	41		37		41		44	52	46	49	40			44		56	40		47	47
P712 Computation	60	54	63	62	46			46	47		48		50		46	48	52	52	40			41		39	48		45	52
P713 Office Work	58	47	59	36	47			32	49		48		53		51	35	51	25	47			22		26	49		49	29
P714 Mechanical-Technical	48	57	49	66	61			62	61		61		67		47	64	56	72	48			62		60	55		39	70
P715 Skilled Trades	50	55	44	52	51			62	57		50		56		43	57	54	55	47			50		51	59		37	56
P716 Farming	44	55	39	58	46			60	47		46		53		52	61	54	58	40			65		63	60		40	58
P717 Labor	50	54	46	49	51			50	50		49		55		44	52	53	53	46			56		44	52		40	52
INFORMATION TEST																												
R102 Vocabulary	47	53	66	74	58			70	41		59		51		52	58	57	68	53			81		75	48		57	78
R103 Literature	52	56	65	78	52			74	47		56		51		52	60	55	72	58			80		78	50		62	76
R104 Music	56	53	67	74	58			72	48		55		53		59	60	58	66	67			78		78	44		58	74
R105 Social Studies	50	59	62	78	51			67	44		55		50		48	60	55	68	52			80		76	49		56	76
R106 Mathematics	55	60	70	88	64			80	54		62		58		53	64	59	79	61			88		80	58		60	85
R107 Physical Science	50	59	65	81	62			72	53		65		62		56	64	61	80	61			83		76	55		65	84
R108 Biological Science	44	56	56	71	60			69	49		58		55		53	60	57	72	56			82		73	51		70	76
ABILITY TEST																												
R230 Total English	56	52	68	70	54			66	42		53		47		44	48	53	57	52			78		76	46		59	74
R250 Reading Comprehension	46	52	60	71	54			68	42		54		51		48	54	52	60	51			78		74	47		59	74
R260 Creativity	52	50	63	71	72			72	53		61		59		57	59	58	65	63			76		69	59		65	74
R270 Mechanical Reasoning	42	57	57	78	73			71	55		65		62		54	62	54	70	60			82		72	55		51	76
R282 Visualization in 3D	45	60	58	74	68			70	60		64		61		53	60	53	63	56			76		67	56		57	70
R290 Abstract Reasoning	49	50	62	75	63			70	53		59		59		45	54	51	62	52			79		66	51		51	70
R311 Arithmetic Reasoning	51	59	64	79	62			70	48		59		58		50	57	57	62	49			80		72	52		55	77
R312 Introductory Math	57	61	71	87	65			80	53		61		59		56	60	62	78	54			84		78	58		57	84
F410 Arithmetic Computation	50	45	59	67	41			56	40		50		41		35	44	52	47	31			74		68	26		50	68
OTHER VARIABLES																												
P*801 Socioeconomic Status	46	52	59	67	49			75	46		50		48		53	62	47	65	56			86		86	40		47	67
F803 H.S. Courses Taken (Aca.)	50	52	63	78	59			78	47		55		51		49	62	55	71	58			80		78	55		57	74
P820 H.S. Grades	55	50	61	81	51			74	43		50		46		56	54	55	68	44			80		76	51		57	78
F830 Amt. of Extracur. Reading	59	57	61	63	62			58	48		61		57		59	61	54	63	64			64		70	60		62	66
P827 Study Habits & Attitudes	51	46	60	71	42			62	47		50		51		47	51	50	61	44			74		70	43		71	73

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 8

	Occupation																	
	a		B		C		D		E		F		G		H		I	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	80	107	338	*	243	*	811	119	44	*	198	*	961	*	81	*	200	*
INTEREST SCALES																		
P701 Phys. Sci., Eng., Math.	39	50	33		48		45	54	38		46		46		51		43	
P702 Bio. Sci., Medicine	41	48	35		50		44	52	35		52		50		45		46	
P703 Public Service	39	52	37		57		49	55	51		54		52		56		45	
P704 Literary-Linguistic	41	42	30		57		42	51	45		53		50		49		45	
P705 Social Service	37	42	44		55		46	39	43		54		50		49		49	
P706 Artistic	44	44	32		56		48	55	54		47		48		54		49	
P707 Musical	48	46	38		52		49	53	49		53		51		54		49	
P708 Sports	37	47	41		47		38	48	40		47		47		38		44	
P709 Hunting & Fishing	36	50	58		36		42	58	19		46		40		36		46	
P710 Business Management	40	48	34		60		49	51	40		54		54		54		46	
P711 Sales	47	52	40		64		52	50	64		58		62		60		57	
P712 Computation	39	52	44		58		49	49	47		53		52		47		52	
P713 Office Work	48	54	49		49		47	35	58		50		50		45		59	
P714 Mechanical-Technical	37	57	55		35		49	57	44		36		44		35		52	
P715 Skilled Trades	45	64	63		41		52	53	51		38		43		39		56	
P716 Farming	42	58	87		40		50	56	33		41		45		40		53	
P717 Labor	53	66	60		44		49	51	50		46		45		38		55	
INFORMATION TEST																		
R102 Vocabulary	40	32	39		58		48	60	45		58		52		58		48	
R103 Literature	42	32	36		66		51	62	55		62		55		63		50	
R104 Music	47	36	38		69		52	63	57		59		59		61		54	
R105 Social Studies	39	36	40		63		50	58	52		56		52		55		46	
R106 Mathematics	50	37	46		65		56	66	47		58		59		66		52	
R107 Physical Science	47	39	45		59		50	63	46		56		53		61		50	
R108 Biological Science	45	38	48		54		50	59	44		53		51		61		49	
ABILITY TEST																		
R230 Total English	36	30	39		62		46	52	43		59		54		65		43	
R250 Reading Comprehension	35	32	38		59		46	56	49		53		50		56		41	
R260 Creativity	37	35	46		66		54	61	40		60		55		64		51	
R270 Mechanical Reasoning	45	44	53		52		53	64	43		47		49		53		45	
R282 Visualization in 3D	44	45	48		51		55	62	36		52		51		57		47	
R290 Abstract Reasoning	35	29	43		57		50	58	32		47		48		53		43	
R311 Arithmetic Reasoning	44	35	50		60		54	62	48		56		55		64		46	
R312 Introductory Math	45	34	49		62		55	63	49		59		56		65		51	
F410 Arithmetic Computation	24	35	40		57		42	45	39		49		49		48		39	
OTHER VARIABLES																		
P*801 Socioeconomic Status	47	28	46		77		62	65	65		63		64		77		49	
F803 H.S. Courses Taken (Aca.)	42	40	30		65		53	55	53		55		56		69		46	
P820 H.S. Grades	41	36	52		54		48	58	54		53		51		53		48	
F830 Amt. of Extracur. Reading	60	46	44		59		51	59	53		58		57		55		51	
P827 Study Habits & Attitudes	38	38	51		58		49	51	48		53		51		48		47	

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 9

	Occupation																							
	a		B		C		D		E		F		G		H		I		J		K		L	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	*	158	612	*	680	*	258	*	270	*	382	*	325	*	291	*	153	*	65	*	51	*	149	*
INTEREST SCALES																								
P701 Phys. Sci., Eng., Math.		52	47		46		47		38		38		40		37		47		42		54		49	
P702 Bio. Sci., Medicine		43	42		39		43		32		38		37		41		42		33		46		43	
P703 Public Service		53	38		40		43		34		36		39		43		38		43		40		45	
P704 Literary-Linguistic		46	36		35		36		29		32		35		42		33		35		35		38	
P705 Social Service		34	40		42		40		34		38		40		44		38		41		40		47	
P706 Artistic		60	47		47		45		36		42		43		46		45		48		36		50	
P707 Musical		47	47		47		49		40		44		42		51		45		49		48		43	
P708 Sports		41	44		42		41		32		34		42		41		33		39		27		45	
P709 Hunting & Fishing		54	46		46		46		46		45		47		46		46		46		45		47	
P710 Business Management		48	37		40		38		30		33		37		40		33		37		36		44	
P711 Sales		58	40		43		40		40		40		40		40		39		44		40		44	
P712 Computation		46	42		44		40		41		38		43		46		43		45		47		43	
P713 Office Work		42	48		49		51		48		46		48		53		47		53		50		53	
P714 Mechanical-Technical		58	63		69		67		73		67		65		54		66		65		63		60	
P715 Skilled Trades		64	59		64		61		65		69		69		59		58		64		61		60	
P716 Farming		60	55		56		60		58		63		61		50		48		53		64		58	
P717 Labor		60	55		59		62		65		64		66		54		54		67		65		58	
INFORMATION TEST																								
R102 Vocabulary		42	39		41		40		35		38		31		40		36		45		46		52	
R103 Literature		50	46		44		43		35		37		33		43		43		45		58		52	
R104 Music		46	47		46		45		39		38		37		44		42		44		57		52	
R105 Social Studies		50	43		42		44		36		35		30		42		40		43		48		50	
R106 Mathematics		59	47		49		42		43		42		36		43		49		45		57		51	
R107 Physical Science		54	49		49		48		45		46		37		43		52		47		56		54	
R108 Biological Science		52	46		43		49		40		43		37		40		55		47		61		53	
ABILITY TEST																								
R230 Total English		39	35		40		34		31		30		31		38		42		42		42		47	
R250 Reading Comprehension		39	40		42		40		35		33		29		37		47		38		49		46	
R260 Creativity		47	48		51		47		50		50		42		49		53		45		63		57	
R270 Mechanical Reasoning		54	51		55		50		50		54		45		44		56		56		62		53	
R282 Visualization in 3D		58	50		54		52		50		50		46		45		51		53		55		54	
R290 Abstract Reasoning		40	44		45		40		42		38		36		42		40		45		46		50	
R311 Arithmetic Reasoning		48	47		50		37		44		42		37		40		50		49		51		55	
R312 Introductory Math		56	46		47		41		39		43		37		41		49		41		55		54	
F410 Arithmetic Computation		30	38		39		31		31		29		31		43		43		23		41		43	
OTHER VARIABLES																								
P*801 Socioeconomic Status		38	43		38		38		36		39		34		40		36		38		49		51	
F803 H.S. Courses Taken (Aca.)		54	39		37		36		34		31		29		37		40		35		50		42	
P820 H.S. Grades		55	45		45		42		40		40		40		42		48		43		46		41	
F830 Amt. of Extracur. Reading		56	53		47		51		49		51		47		47		51		46		61		52	
P827 Study Habits & Attitudes		46	41		45		35		38		34		36		43		42		36		46		38	

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 10

	Occupation													
Sex	A		B		C		D		E		F		G	
Number =	M	F	M	F	M	F	M	F	M	F	M	F	M	F
	195	*	190	*	180	*	262	*	119	*	44	*	224	*
INTEREST SCALES														
P701 Phys. Sci., Eng., Math.	36		41		34		50		39		50		36	
P702 Bio. Sci., Medicine	36		39		37		47		36		45		40	
P703 Public Service	39		40		36		48		39		43		39	
P704 Literary-Linguistic	37		40		34		45		33		45		36	
P705 Social Service	45		48		43		48		36		55		46	
P706 Artistic	47		48		43		49		35		43		43	
P707 Musical	47		49		44		49		42		50		42	
P708 Sports	44		46		41		45		40		44		44	
P709 Hunting & Fishing	47		46		50		53		57		63		47	
P710 Business Management	37		39		36		45		35		48		40	
P711 Sales	44		40		44		47		37		45		42	
P712 Computation	43		43		42		53		44		48		41	
P713 Office Work	49		49		54		52		49		50		51	
P714 Mechanical-Technical	64		61		61		61		56		68		60	
P715 Skilled Trades	70		67		70		62		61		68		64	
P716 Farming	59		63		61		59		64		70		55	
P717 Labor	63		63		63		62		58		64		64	
INFORMATION TEST														
R102 Vocabulary	36		37		33		48		30		34		35	
R103 Literature	33		41		33		46		36		28		42	
R104 Music	38		42		36		48		37		35		38	
R105 Social Studies	35		39		33		47		38		28		39	
R106 Mathematics	40		47		39		47		39		33		44	
R107 Physical Science	39		41		40		47		38		33		40	
R108 Biological Science	38		45		40		51		40		38		43	
ABILITY TEST														
R230 Total English	26		35		30		41		30		29		33	
R250 Reading Comprehension	31		38		29		42		32		28		32	
R260 Creativity	43		43		44		51		40		38		43	
R270 Mechanical Reasoning	41		47		47		50		42		38		44	
R282 Visualization in 3D	44		48		56		50		42		41		43	
R290 Abstract Reasoning	31		39		45		44		32		32		40	
R311 Arithmetic Reasoning	43		42		43		47		37		42		42	
R312 Introductory Math	40		46		39		48		38		32		48	
F410 Arithmetic Computation	29		37		30		37		29		28		30	
OTHER VARIABLES														
P*801 Socioeconomic Status	38		43		38		43		35		30		42	
F803 H.S. Courses Taken (Aca.)	38		37		27		40		37		42		41	
P820 H.S. Grades	35		46		40		50		42		50		40	
F830 Amt. of Extracur. Reading	53		48		48		53		49		48		51	
P827 Study Habits & Attitudes	36		40		43		42		41		27		40	

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 11

	Occupation																											
	a		b		C		D		e		f		G		h		i		j		k		l		m		n	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	52	170	*	399	323	90	334	70	70	389	*	244	43	*	*	110	*	142	*	2830	*	172	*	140	*	190	*	290
INTEREST SCALES																												
P701 Phys. Sci., Eng., Math.	31	58		55	44	55	54	59	36	48		48	44			52		54		52		44		56		54		49
P702 Bio. Sci., Medicine	42	49		42	46	50	59	48	45	44		44	41			46		50		47		38		62		49		44
P703 Public Service	50	50		54	49	59	62	55	52	54		54	54			54		59		55		55		56		54		52
P704 Literary-Linguistic	43	46		41	50	48	59	39	53	44		41	50			44		50		49		50		48		48		42
P705 Social Service	50	44		38	54	43	50	48	59	42		43	56			42		52		46		46		50		48		48
P706 Artistic	35	44		42	47	48	53	41	44	43		45	55			45		52		48		48		48		44		40
P707 Musical	56	46		46	56	48	50	43	56	48		46	53			48		50		51		48		50		49		46
P708 Sports	43	52		44	44	56	46	48	44	46		47	52			49		48		48		48		56		52		44
P709 Hunting & Fishing	35	54		52	46	56	36	55	45	52		50	39			53		54		54		52		54		53		45
P710 Business Management	38	48		50	48	52	57	54	48	50		53	42			43		56		52		46		48		54		50
P711 Sales	45	54		55	52	55	60	52	60	54		55	45			48		61		53		54		48		54		52
P712 Computation	44	66		68	55	55	64	73	55	58		61	50			52		52		58		58		53		59		56
P713 Office Work	57	53		55	63	49	50	57	66	56		56	59			50		46		58		58		48		64		56
P714 Mechanical-Technical	35	56		57	53	63	31	58	43	56		55	51			62		55		55		52		56		55		54
P715 Skilled Trades	48	55		60	58	65	34	55	56	62		60	52			64		60		58		52		54		58		58
P716 Farming	43	64		54	53	58	40	59	44	54		60	46			54		58		54		50		52		56		51
P717 Labor	46	56		58	60	62	35	59	54	62		62	52			63		58		56		50		50		58		60
INFORMATION TEST																												
R102 Vocabulary	37	56		50	39	40	67	52	27	44		38	28			45		50		56		56		60		46		42
R103 Literature	48	58		54	44	43	71	54	43	46		44	52			44		54		55		61		64		54		46
R104 Music	48	54		51	50	45	67	45	56	49		44	55			48		52		57		58		61		49		47
R105 Social Studies	42	56		56	42	45	69	51	39	44		45	45			44		54		58		58		58		51		47
R106 Mathematics	46	62		59	46	46	72	60	40	50		43	49			47		57		58		64		64		54		50
R107 Physical Science	41	60		56	42	47	68	56	38	48		44	44			52		50		58		58		58		56		48
R108 Biological Science	37	52		53	40	44	63	53	35	49		43	49			48		50		54		54		54		52		44
ABILITY TEST																												
R230 Total English	44	51		52	39	40	72	49	49	42		36	34			42		40		60		62		57		49		40
R250 Reading Comprehension	45	47		50	40	44	69	53	41	39		40	36			40		48		56		55		54		50		43
R260 Creativity	46	55		55	45	49	63	60	50	46		47	40			43		54		57		59		62		53		44
R270 Mechanical Reasoning	37	61		58	37	48	54	56	39	49		50	44			46		54		56		60		58		52		48
R282 Visualization in 3D	35	60		58	37	46	57	53	42	50		48	45			46		51		56		54		50		55		48
R290 Abstract Reasoning	36	54		50	41	37	61	50	42	42		40	31			42		45		52		53		50		52		40
R311 Arithmetic Reasoning	52	58		60	46	46	70	60	40	48		42	35			44		54		56		58		54		54		44
R312 Introductory Math	40	62		59	47	51	73	57	47	48		47	40			44		53		58		60		63		58		52
F410 Arithmetic Computation	40	44		52	38	34	65	50	55	38		42	36			31		36		52		54		52		54		41
OTHER VARIABLES																												
P*801 Socioeconomic Status	42	50		44	37	42	76	49	36	40		42	38			32		51		52		56		63		48		40
F803 H.S. Courses Taken (Aca.)	38	54		50	45	41	69	50	37	44		46	41			44		56		50		52		61		47		50
P820 H.S. Grades	51	54		53	47	47	64	63	44	48		40	45			40		47		59		63		51		60		50
F830 Amt. of Extracur. Reading	61	63		58	59	54	58	61	45	55		49	60			56		58		58		60		62		54		56
P827 Study Habits & Attitudes	62	49		52	43	47	67	55	43	46		40	47			42		45		56		59		56		54		52

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

MEAN PERCENTILE RANKS FOR MEN AND WOMEN IN EACH OCCUPATION IN CAREER GROUP 12

	Occupation																	
	A		B		C		D		e		F		G		h		I	
Sex	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number =	81	*	280	*	683	*	143	*	47	719	927	239	80	*	*	489	540	*
INTEREST SCALES																		
P701 Phys. Sci., Eng., Math.	35		31		32		42		29	46	37	52	45			62	40	
P702 Bio. Sci., Medicine	40		32		35		42		50	45	38	46	47			70	45	
P703 Public Service	36		42		37		47		54	50	42	55	50			52	51	
P704 Literary-Linguistic	38		31		29		36		58	40	37	44	49			46	45	
P705 Social Service	48		40		45		47		55	39	48	43	53			52	50	
P706 Artistic	40		37		33		43		67	50	42	42	50			46	43	
P707 Musical	51		43		39		47		77	46	48	47	60			52	49	
P708 Sports	50		40		41		45		22	48	46	50	47			52	46	
P709 Hunting & Fishing	57		46		52		48		19	56	46	55	47			56	47	
P710 Business Management	35		37		33		45		41	44	41	52	40			38	43	
P711 Sales	44		37		42		44		47	48	46	53	47			41	42	
P712 Computation	48		39		43		51		49	47	46	56	45			43	44	
P713 Office Work	53		47		50		52		63	44	54	55	59			36	47	
P714 Mechanical-Technical	54		57		57		50		27	55	58	63	61			63	44	
P715 Skilled Trades	66		63		64		58		41	64	66	68	64			63	47	
P716 Farming	60		65		83		54		28	56	59	57	55			61	50	
P717 Labor	60		68		61		60		29	61	67	71	64			62	48	
INFORMATION TEST																		
R102 Vocabulary	25		30		35		39		34	41	31	30	41			47	50	
R103 Literature	34		35		34		43		34	44	33	34	51			46	54	
R104 Music	35		39		39		49		48	46	37	30	44			50	54	
R105 Social Studies	35		33		38		43		34	42	35	33	47			49	51	
R106 Mathematics	39		35		45		44		33	48	38	39	44			53	49	
R107 Physical Science	37		36		42		41		29	50	38	39	44			56	48	
R108 Biological Science	38		39		44		42		30	44	38	38	47			54	48	
ABILITY TEST																		
R230 Total English	29		30		42		31		31	36	31	23	38			40	45	
R250 Reading Comprehension	36		30		34		42		29	39	31	29	44			46	49	
R260 Creativity	38		41		44		46		34	48	40	37	49			50	51	
R270 Mechanical Reasoning	37		40		50		44		33	56	38	41	46			52	44	
R282 Visualization in 3D	40		41		46		44		42	54	40	39	54			52	44	
R290 Abstract Reasoning	34		34		40		41		30	45	31	26	43			42	44	
R311 Arithmetic Reasoning	39		34		50		42		35	48	38	39	38			48	51	
R312 Introductory Math	41		35		46		44		30	46	38	40	43			50	47	
F410 Arithmetic Computation	31		26		41		34		26	32	28	28	33			32	37	
OTHER VARIABLES																		
P*801 Socioeconomic Status	37		36		44		43		49	46	30	27	38			40	49	
F803 H.S. Courses Taken (Aca.)	36		31		30		42		43	44	33	33	37			58	51	
P820 H.S. Grades	52		34		50		34		41	42	41	36	43			45	48	
F830 Amt. of Extracur. Reading	41		48		47		46		54	51	52	52	66			58	55	
P827 Study Habits & Attitudes	39		33		46		36		45	38	42	35	39			46	45	

*Opposite sex percentiles are listed only for those occupations for which there were more than ten 12th-grade respondents.

APPENDIX A
Part III
More Accurate Methods of Estimating "Other Variables"

Socioeconomic Status. To estimate the student's socioeconomic status which is a composite score in the TALENT series of variables, you can use the table on page 355..* Don't hesitate to duplicate this and the several following tables as well if you find it useful to have the student make his own estimates. What needs to be done is to have the student consider each of the nine items in the table and indicate the percentile rank category in which his personal and family circumstances place him in each case. When the student indicates his answers to the nine questions on the table itself, the table will also array the student's answers in ascending order. Simply start with his lowest percentile rank group and count up his tallies until you reach the fifth (middle) tally. The percentile rank of the group in which that tally falls will be a fair estimate of his percentile rank on the TALENT composite concerning socioeconomic status. Because socioeconomic status has a different meaning across racial lines, a more realistic measure of socioeconomic status of a minority student relative to the minority population can be obtained by counting over to the **seventh** instead of the **fifth** tally. Greater precision can be given this estimate by interpolating to a percentile rank within a category when the fifth or seventh tally is one of several tallies in a group.

*The dollar amounts indicated in the table have been adjusted from 1960 to current dollar values. The other values are still as they were used in 1960, but adjustment for change is not necessary in those items.

High School Courses Taken (Academic)

To determine the student's percentile rating for the academic orientation of the high school courses he has taken you can use the table on page 356. It is designed for 12th grade students so some modification as explained below is necessary if it is to be used for students of lower grades.

To use the table for a 12th grade student, first ascertain if he is in the college preparatory program or curriculum, the general, commercial or business curriculum, or some other curriculum. The table indicates the percentile rank associated with each curriculum category. When a category includes more than one percentile rank group, use the mid-percentile rank for the group of percentiles included. For instance, the college preparatory curriculum group spans the rank range from 37.5 to 99.5. This is a range of 62 percentile ranks. One half this range is 31. 37.5 + 31 is 68.5 or about the 70th percentile.

Science, mathematics, foreign language, social studies, and English courses are handled merely by counting the number of courses the student has taken of each kind and entering the table to get the percentile rank associated with it. If a student has had some calculus unit in one or more of his mathematics courses, he would be given a percentile rank of 91 (82.5 + ½ (99.5 − 82.5)). If he didn't have a calculus unit in one or more of his mathematics classes, he would be given a percentile rank of 42 (0.5 + ½ (82.5 − 0.5)). The number of courses asked for refers to the number of **semesters** of courses.

There are seven items in this score. Each of the first five are to be counted twice, because they are more discriminating. Therefore, there are a total of twelve "weights." The student's percentile rank is then best estimated by taking the average of the middle ranks, the sixth and seventh, starting from the left side of the table.

Since the table is for 12th grade students, some modification of scores is necessary when a student has not yet reached the 12th grade. Modifications can be made in accord with how many courses a student might have had in each category in the curriculum of his school when he is a 9th, 10th, or 11th grader. When such more exact data are not available an approximation might still be made by multiplying a 9th grader's number of courses in each category by 4, a 10th grader's by 2, and an 11th grader's by 4/3. For example, if a high school sophomore, in the spring semester, has had two courses in science, including any for which he is presently enrolled, you would double this because by the time he is in twelfth grade he would, if he continued as he is going, probably have taken four courses in science. Since four science courses gives a percentile of 75, he would place at the 75th percentile in regard to science courses. Courses in mathematics, foreign languages, social studies, and English yield percentiles in a similar way. Once percentile ranks are estimated as above for a 10th grader, his percentile rank for the variable would still be determined by double tallying all but social studies and English courses in a distribution of percentile ranks and determining what the mid-percentile rank proves to be.

Amount of Extracurricular Reading

The TALENT Amount of Extracurricular Reading variable aggregates answers to five questions. The questions are given in the table on page 357 along with the answers which correspond to the midpoints of seven percentile rank groups. Item 56, which consists of the student's estimate of the number of books other than comic books or magazines which he has read in the past 12 months, is five times as important as each other item in defining the composite score. For this reason the student's answer to this question alone will determine where his mid-percentile rank will fall for his answers to all five questions. In entering the student's answer to question 56, you would make five tallies in the category in which it falls. There would be only one tally in the percentile rank category corresponding to the student's answer to any one of the other four questions. The mid-tally is therefore the fifth tally and this fifth tally always has to be in the percentile rank category for the answer to question 56.

If you or the student is interested in greater precision for the estimate of his amount of extracurricular reading, the student could complete answers to the other four questions in the table below. The other answers would indicate whether the estimate should be more at the lower or upper boundary of the category in which the answer to question 56 falls, depending on whether the other four answers were mostly below or mostly above the percentile rank category of the student's answer to question 56.

Study Habits and Attitudes

The TALENT Study Habits and Attitudes variable aggregates answers to 16 questions. The questions are given in the table on page 358 along with the answers which correspond to the midpoints of seven percentile rank groups. Item 97, which depends on the student's report of the average number of hours he studies a week including study time in school, is twice as important as each other item in defining the composite score. Hence if an extreme shortcut is desired in estimating a student's standing on study habits and attitudes, the student's estimate to this question alone would furnish a somewhat reasonable guess of his general study habits and attitudes.

Should you or the student want a more refined estimate of the student's study habits and attitudes, secure the student's answers to each of the other 15 questions in the table below as well. If you make copies of the table, you or the student can just mark answers in the percentile rank category for each question. That procedure has the advantage of providing the needed sequencing of answers in estimating the mid-percentile rank of the student's answers to these questions. The table will put the answers in visual sequence for you. Therefore in finding the mid-percentile rank simply make a double tally for the student's answer to question 97 and then begin counting tallies from percentile rank category 1 until you reach the tally which is half the total number of tallies. If the student has answered all 16 questions, the median or mid-tally will be 9 since you will then have 16 tallies for the answers plus one more for the double tallying of question 97. If the mid-tally is one of several tallies in a percentile rank group, linear interpolation from the percentile rank boundaries of the group will provide a better estimate of the student's percentile rank than use of the percentile rank midpoint itself. However, the percentile rank midpoint will still give quite a satisfactory estimate.

EQUIVALENCY TABLE FOR ESTIMATING SOCIOECONOMIC STATUS

ITEM	PERCENTILE RANK						
	1	10	25	50	75	90	99
1[illegible] - Present value of family home	<$7,200	$7200-12,599	$12,600-17,199	$17,200-22,299	$22,300-28,499	$28,500-35,300	>$35,300
173 - Estimate of family's total income for last year	<$3,200	$3,200-6,799	$6,800-9,899	$9,900-13,099	$13,100-16,199	$16,200-19,399	>$19,400
176 - Number of books in home	Very few (0-10)	Some (11-50)	50-100	1 bookcase full	2 bookcases full	3 bookcases full	>3 bookcases full--a library
190 - Automatic washer, automatic clothes dryer, electric dishwasher, electric or gas refrigerator, vacuum cleaner, home food freezer--total number of	0	1	2	3	4	5	6
191 - Telephone, television set, radio, stereo set--total number of	1	2	3	3	4	4	4
195 - Room of your own, own study desk, typewriter--total number of	0	0	1	2	2	3	3
206 - Closest to father's work	Farm or ranch worker Workman or laborer Private household worker		Service worker, semi-skilled worker	Protective worker, clerical, or skilled worker or foreman	Farm or ranch owner, proprietor, technical, salesman	Official Professional	
218 - Highest level of father's education	None, or some grade school	Some high school, not graduated	Graduated from high school	Some education beyond high school, no degree	Graduated from college	Master's degree	Some work beyond master's
219 - Highest level of mother's education	Completed grade school	Some high school, not graduated	Graduated from high school	Vocational or business school after high school	Some community college, not graduated	Graduated from college	Master's degree or more

TABLE FOR ESTIMATING EQUIVALENCIES OF ACADEMIC ORIENTATION OF HIGH SCHOOL COURSES TAKEN

(12TH GRADE RECORD)

Item and Weight		Percentile Rank						
		1	10	25	50	75	90	99
91. High school program or curriculum	(X2)	All others (% = 9.5)		General, commercial, or business	College preparatory (% = 68.5)			
98. Science courses (biology, chemistry, general science, physics, etc.)	(X2)	0	1 (% = 21.5)		2	3-4	5	6 or more
104. Mathematics (algegra, geometry, trigonometry, etc., excluding commercial arithmetic or shop math.)	(X2)	0 (% = 9.5)		1	2	3	4 or more (% = 91)	
105. Calculus included in any mathematics course taken	(X2)	No (% = 41.5)					Yes (% = 91)	
99. Foreign languages (French, German, Spanish, Latin, etc.)	(X2)	0 (% = 19)			1	2	3 or more (% = 91)	
100. Social studies (history, civics, government, economics, etc.)		0	1	2	3-4	5 or more (% = 71)		
101. English courses (grammar, composition, literature, etc.)		0	1	2	3 or more (% = 68.5)			

TABLE FOR ESTIMATING PERCENTILE RANK EQUIVALENT FOR AMOUNT OF EXTRACURRICULAR READING COMPOSITE

Item (with weight)	Percentile Rank						
	1	10	25	50	75	90	99
56. How many books have you read (not including those required for school) in the past 12 months? *Don't count magazines or comic books.* (X5)	None			1-5	6-10	11-15	>15
Items 57-64. How many books or magazines have you read in each of the following groups (not including those required for school) in the past 12 months?							
58. Science fiction books or magazines (not comic books)	None			1	2	3-4	>4
59. Science--non-fiction	None				1	2-4	>4
60. Plays, poetry, essays, literary criticism, or classics	None			2	3-4	5	>5
61. Politics, world affairs, biography, autobiography, historical novels	None			1	2-4	>4	

TABLE FOR ESTIMATING PERCENTILE RANK EQUIVALENT
FOR STUDY HABITS AND ATTITUDES COMPOSITE

Item (with weight)	Percentile Rank						
	1	10	25	50	75	90	99
97. On the average how may hours do you study each week? *Include study periods in school as well as studying at home.* (X2)	0	1	2-4	5-9	10-14	15-19	>19
69. I make sure that I understand what I am to do before I start an assignment.	Almost never	Not very often	About 1/2 time	Most of the time	Almost always		
70. I seem to accomplish very little compared to the amount of time I spend studying.	Almost always		Most of the time	About 1/2 time	Not very often	Almost never	
71. Lack of interest in my school work makes it difficult for me to keep my attention on what I am doing.	Almost always		Most of the time	About 1/2 time	Not very often	Almost never	
73. Failure to pay attention in class has caused my marks to be lowered.	Almost always	Most of the time	About 1/2 time	Not very often	Almost never		
74. I consider a very difficult assignment a challenge to my abilities.	Almost never		Not very often	About 1/2 time	Most of the time	Almost always	
75. I do my assignments so quickly that I don't do my best work.	Almost always	Most of the time	About 1/2 time	Not very often		Almost never	
76. I have missed assignments or other important things that the teacher has said, because I was not paying attention.	Almost always	Most of the time	About 1/2 time	Not very often	Almost never		
77. My teachers have criticized me for turning in a sloppy assignment.	Almost always	Most of the time	About 1/2 time	Not very often	Almost never		
78. Unless I really like a course, I do only enough to get by.	Almost always		Most of the time	About 1/2 time	Not very often	Almost never	
80. In class I can't seem to keep my mind on what the teacher is saying.	Almost always	Most of the time	About 1/2 time	Not very often		Almost never	
81. I get behind in my school assignments.	Almost always	Most of the time	About 1/2 time	Not very often	Almost never		
85. I feel that I am taking courses that will not help me much in an occupation after I leave school.	Almost always	Most of the time	About 1/2 time	Not very often	Almost never		
86. When studying for a test, I am able to pick out important points to learn.	Almost never	Not very often	About 1/2 time	Most of the time		Almost always	
88. I keep up to date on my assignments by doing my work every day.	Almost never	Not very often	About 1/2 time	Most of the time	Almost always		
65. I do a little more than the course requires.	Almost never		Not very often		About 1/2 time	Most of the time	Almost always

APPENDIX B
STATISTICAL CHECKS

Statistical Checking of Occupational Groups

A check on the homogeneity of the career groups was made by computing point-biserial correlation coefficients between each of the variables and each of the occupational groups. These correlations are primarily a function of the difference between the means for the occupational group and the total group, including all occupations and the proportion of students in the specific occupation being correlated. The multiple point-biserial correlation coefficient was also calculated to determine how well the entire group of variables would predict membership in a specific occupational group. This same operation was done separately for the cognitive variables and noncognitive variables.

Point-biserial correlation coefficients are very seriously affected by the size of the occupational group. Groups containing only a very small proportion of the cases cannot obtain very high point-biserial conditions or corresponding multiple correlation coefficients even though some of the tests discriminate membership in a group almost perfectly. To obtain a more meaningful comparison of the results from the different occupational groups, the multiple correlations were therefore adjusted by obtaining the ratio of the multiple correlation coefficient calculated using the point biserials and the maximum coefficient which would be possible with the dichotomy in the samples. These values are equivalent to biserial correlation coefficient values as contrasted with point-biserial values. Comparison of these adjusted multiple correlation coefficients and also of the beta weights in the prediction equation for occupations in terms of test scores provided a further check on the similarity of the occupations within the initial clusters.

The final check on the selected job clusters consisted of comparing the "d-square" values between an occupation and the other occupations within the group in which it was classified and the "d-square" values for the occupation as compared with each of the other occupations in the other eleven groups. These "d-square" values represent the square of the distance separating the two occupations in n-dimensional space, where n represents the number of variables. To make these distances more useful, the variabilities of all variables were first transformed to unit values.

As an aid in comparing these values, median values for "d-square" were calculated to summarize the "d-square" values between each occupation and all of the occupations within each one of the 12 occupational groups. The "d-square" analysis for males was done for only the 74 occupations which were chosen by at least 30 students in the 12th-grade follow-up group. The "d-square" analyses were carried out separately for the 64 cognitive variables and for the 45 noncognitive variables, and the analyses were repeated for the same occupations on the 11th-grade follow-up group. In the "d-square" analysis for females, only about 45 occupations had enough students, 30 or more, to justify inclusion. The "d-square" analyses for females were carried out on both the 11th- and 12th-grade groups using the 64 cognitive variables and the 45 noncognitive variables. As a result of these analyses, two changes in grouping were made. Both airplane pilot and military officer had originally been classified with engineers and scientists. They both appeared to fit much better with the business administration group. For further details, consult Flanagan et al., 1971.

Prediction of Careers and Career Groups

The **Career Data Book** is built upon the assumption that abilities and interests are important measures of the differences between persons in different occupations. If the traits underlying the ability and interest measures are relevant to career choice, then to some extent these choices will be predictable from the individual's scores. To examine this hypothesis we have attempted to predict from interests and a few abilities the careers and career groups chosen by a small random sample of 12th grade men in our 5-year follow-up.

The prediction of career groups was based on a method which was very quick to use but which necessarily excluded from consideration much of the information in the individual profiles: For each subject his interest scale with the highest percentile was found. This in turn determined a set of career groups which showed a high average interest for that particular scale.

The choice of career group from that set was then based on the student's average of the following scores: Total English, Reading Comprehension, Creativity, Arithmetic Reasoning, Introductory Math, and Mathematical Computation. For example, if a student's highest interest was Computation, Career Groups 1, 3, and 11 were considered. If the average ability score was greater than the 70th percentile, Career Group 1 was chosen; Career Group 3 was chosen for average abilities between the 60th and 70th percentile; for lower abilities, Career Group 11 was chosen. Tables 1 and 2 on page 360 present the rules used in this demonstration. The second table contains rules to be used when more than one career group is indicated on the basis of Table 1.

Within the chosen career group, the student was predicted to be in a particular occupation based (for the most part) on finding the career whose average profile on information and ability scores was closest to the student's profile. These predictions of specific careers were done only for the purposes of this study and such narrow choices are not recommended for counselors or students.

Of the 138 men included in the sample, 42 (30%) were placed in the correct career group by using this quick method; this is a significantly higher success rate than would be found by chance (8%). Predictions were more accurate for the higher ability career groups (1, 2, and 5) with an average success rate of 50%; predictions for the heterogeneous career groups requiring lower abilities (3, 8, 12) were much less successful (average success rate was 13%). In the prediction of specific occupations only 4 students (3%) were correctly classified; this rate, though significantly above chance, emphasizes the inappropriateness and futility of trying to counsel students into single careers.

Counselors and students can make more full and effective use of the students' scores on both interests and abilities than was achieved in this demonstration; in particular considering the student's several highest interests instead of merely one interest would lead to a wider range of appropriate choices for the student. This demonstration calls attention to the need for students to be counseled to consider career groups suitable for them rather than selecting a single specific occupation.

Table 1

PREDICTED CAREER GROUP(S)

Student's Highest Interest	Average of six abilities			
	Lower than 50	Between 50 and 60	Between 60 and 70	Higher than 70
Phys. Sci., Eng., Math	7*	7	7	1
Bio. Sci., Medicine	7	7	2	2
Public Service	4	4	5	5
Literary-Linguistic	4	4	5	5
Social Service	4	4	4	5
Artistic	4,6	4,6	4,6	4,6
Musical	4,6	4,6	4,6	4,6
Business Management	8	3,4	3,4	3,4
Sales	8	8	3	3
Computation	11	11	3	1
Office Work	11	11	3	3
Mechanical-Technical	9,10,12	9,10,12	9,10,12	7
Skilled Trades	9,10,12	9,10,12	9,10,12	9,10,12
Farming	10,12	7	4	2
Labor	9,10,12	11	11	11

*Numbers in table refer to career groups.

Table 2

FURTHER RULES FOR CHOOSING CAREER GROUPS*

If choice is between:	Choose on the basis of the following:
3 vs. 4	Choose 4 if Social Service Interest score minus Office Work Interest score $\geq$18; otherwise, choose 3.
Art: 4 vs. 6	Choose 6 if Art Interest score minus Social Service Interest score $\geq$28; otherwise choose 4.
Music: 4 vs. 6	Choose 6 if Music Interest score minus Social Service Interest score $\geq$15; otherwise choose 4.
9 vs. 10,12	Choose 9 if average of Visualization in 3D and Mechanical Reasoning Ability scores $\geq$50; otherwise choose 10,12.
10 vs. 12	Choose 10 if Mechanical-Technical Interest score $\geq$60; otherwise choose 12.

*Needed only when Table 1 produces several career groups.

APPENDIX C
ALPHABETICAL LIST OF OCCUPATIONS

Occupation	Career Group	Page
Account Recording Worker/Misc. (Females)	11	276
Accountant, Auditor, Comptroller	3	78
Accountant (CPA)	3	84
Advertising Artist	6	172
Advertising Worker	3	80
Aerospace Engineer	1	32
Agricultural Specialist	2	60
Airplane Mechanic	9	240
Appliance Repairman	9	250
Architect	1	26
Art Teacher (Females)	6	176
Artist/Painter, Sculptor, etc. (Females)	6	170
Attorney	5	144
Auditor, Accountant, Comptroller	3	78
Auto Driver	12	308
Auto Mechanic	9	242
Auto Salesman	8	222
Bank Clerk	11	282
Biological Science Laboratory Technician (Females)	7	198
Biologist, Zoologist	2	62
Bookkeeper (Females)	11	278
Bricklayer	10	260
Building Construction/Misc.	10	262
Bus Driver	12	308
Business Administration and Management (n.e.c.)*	3	82
Business, Industry, Commerce (n.e.c.)	3	90
Business Supervisor	8	230
Butcher, Meat Cutter	12	306
Carpenter	10	264
Certified Public Accountant	3	84
Chemical Engineer	1	34
Chemist	1	28
Civil/Hydraulic Engineer	1	36
Clergyman	4	114
Clerical Worker/Misc.	11	280
Clerk - Bank	11	282
Clerk - Miscellaneous (Females)	11	284
Clerk/Sales (Females)	8	214
Clothing, Fashion Trades (Females)	9	234
College Teacher (see specific field)		
College Teacher (n.e.c.)	5	152
Commerce, Industry, Business (n.e.c.)	3	90
Commercial Artist/Advertising, Fashion, Illustrator, etc.	6	172
Commercial Education Teacher (Females)	3	110
Comptroller, Accountant, Auditor	3	78
Computer - EAM Operator, Supervisor	7	184
Computer - Programmer	7	186
Computer - Repair Serviceman	7	188
Conservation/Wildlife Specialist	2	74
Contractor, Proprietor (in business for self)	8	220
Counseling (Females)	4	116

Occupation	Career Group	Page
Dental Hygienist (Females)	7	190
Dental Laboratory Technician (Females)	7	198
Dental Secretary (Females)	11	298
Dental Technologist (Females)	7	210
Dentist	2	64
Diplomat	5	138
Doctor	2	70
Draftsman	7	192
Driver - Auto, Bus, Truck	12	308
EAM Operator, Supervisor - Computer	7	184
Economist	5	140
Efficiency Expert, Industrial Engineer, Production Manager (n.e.c.)	3	86
Electrical/Electronic Engineer	1	38
Electrician (n.e.c.)	9	236
Electronics Technician	7	194
Electronics Worker (n.e.c.)	7	196
Elementary Teacher (Females)	4	124
Engineer (n.e.c.)	1	30
Engineer - Aerospace	1	32
Engineer - Chemical	1	34
Engineer - Civil, Hydraulic	1	36
Engineer - Electrical, Electronic	1	38
Engineer - Mechanical, Automotive	1	40
Engineering Laboratory Technician	7	200
English Teacher - College (Females)	5	154
English Teacher - High School (Females)	5	156
Farming/Ranching - Other (Renters and Workers)	12	310
Farming/Ranching - Owner	8	216
Fashion Artist	6	172
Fashion Trades, Clothing (Females)	9	234
Finance Worker	3	88
Fireman	12	312
Foreign Language Teacher - College (Females)	5	158
Foreign Language Teacher - High School (Females)	5	160
Foreman (n.e.c.)	10	266
Geologist	1	42
Guidance - Counseling (Females)	4	116
Guidance - Vocational/Educational (Females)	4	118
Hairdresser (Females)	12	314
Handicapped - Teacher of (Females)	4	130
Heavy Equipment Operator	10	268
High School Teacher (see specific field)		
High School Teacher (n.e.c.) (Females)	4	126
Home Economics Teacher, High School (Females)	4	132
Hotel Clerk, Receptionist, etc. (Females)	11	292

*n.e.c. means "not elsewhere classified"

Occupation	Career Group	Page
Illustrator - Commercial Artist	6	172
Industrial Engineer, Efficiency Expert, Production Manager (n.e.c.)*	3	86
Industrial Machine Repairman	9	252
Industry, Business, Commerce (n.e.c.)	3	90
Installer, Telephone	9	256
Instrumentalist, Musician	6	174
Insurance Salesman	8	224
Investment Consultant	3	92
Journalist, Reporter	5	142
Keypunch Operator (Females)	11	286
Laboratory Technician/Biological Science, Dental, Medical (Females)	7	198
Laboratory Technician/Physical Science, Engineering, etc.	7	200
Laborer/General	12	316
Lawyer	5	144
Legal Secretary (Females)	11	296
Librarian (Females)	5	146
M.D.	2	70
Machinist	9	238
Manager/Sales	8	218
Manufacturing Management	3	94
Marketing and Wholesale/Retail Trade Manager	3	96
Mason	10	260
Mathematician, Statistician	1	44
Mathematics Teacher - College	1	46
Mathematics Teacher - High School (Females)	1	48
Meat Cutter, Butcher	12	306
Mechanic - Airplane	9	240
Mechanic - Auto	9	242
Mechanic - Other (n.e.c.)	9	244
Mechanical, Automotive Engineer	1	40
Medical/Dental Secretary (Females)	11	298
Medical Laboratory Technician (Females)	7	198
Medical Technologist (Females)	7	210
Metal Worker	9	246
Military/Enlisted	12	318
Military Officer	3	98
Mining, Quarrying, etc.	10	270
Music Teacher (Females)	6	178
Musician/Instrumentalist	6	174
Nurse/Practical (Females)	12	320
Nurse - RN (Females)	2	66
Office Machine Repairman	9	254
Operator - Keypunch (Females)	11	286
Operator - Radio, Telegraph, and Teletype	11	288
Operator - Telephone (PBX) (Females)	11	290
Painter (Artist) (Females)	6	170
Painter (Construction Trades)	10	260
PBX Operator (Females)	11	290
Personnel Administration	3	100
Pharmacist	2	68
Photographer	7	202
Physical Education Teacher (Females)	4	134
Physical Science Laboratory Technician	7	200
Physical Scientist (n.e.c.)	1	50
Physical Therapist (Females)	7	204
Physician	2	70
Physicist	1	52
Physiotherapist (Females)	7	204
Pilot	3	102
Pipefitter, Plumber	10	272
Plasterer	10	260
Plumber, Pipefitter	10	272
Policeman	12	322
Practical Nurse (Females)	12	320
Preschool Teacher (Females)	4	128
Printing Trades	9	248
Production Manager, Efficiency Expert, Industrial Engineer (n.e.c.)	3	86
Professor	5	152
Programmer - Computer	7	186
Proprietor, Contractor (in business for self)	8	220
Psychologist	5	148
Purchasing Agent	3	104
Quarrying, Mining, etc.	10	270
R.N. (Females)	2	66
Radio Operator	11	288
Ranching/Farming - Other (Renters and Workers)	12	310
Ranching/Farming - Owner	8	216
Real Estate Salesman	8	228
Receptionist, Hotel Clerk, etc. (Females)	11	292
Registered Nurse (Females)	2	66
Repair Serviceman - Computer	7	188
Repairman - Appliance	9	250
Repairman - Industrial Machine	9	252
Repairman - Office Machine	9	254
Repairman - Telephone (including installers)	9	256
Reporter, Journalist	5	142
Retail Buyer (Females)	3	106
Roofer	10	260
Sales Clerk (Females)	8	214
Sales Manager	8	218
Salesman - Auto	8	222
Salesman - Insurance	8	224
Salesman - Other (n.e.c.)	8	226
Salesman - Real Estate	8	228
Science Teacher - College	1	54
Science Teacher - High School	1	56
Sculptor (Females)	6	170
Secretary (n.e.c.) (Females)	11	294
Secretary - Legal (Females)	11	296
Secretary - Medical/Dental (Females)	11	298
Social Sciences and Studies Teacher - College	5	162
Social Sciences and Studies Teacher - High School	5	164

*n.e.c. means "not elsewhere classified"

Occupation	Career Group	Page
Social Scientist	5	150
Social Worker (Females)	4	120
Specialized Therapist (Misc.) (Females)	7	206
Statistician, Mathematician	1	44
Stenographer, etc. (Females)	11	300
Stockbroker	3	108
Supervisor/Business	8	230
Surveyor	7	208
Teacher (n.e.c.)* (Females)	4	122
Preschool (Females)	4	128
Elementary (Females)	4	124
High School (n.e.c.) (Females)	4	126
Commercial Education (Females)	3	110
English (Females)	5	156
Foreign Language (Females)	5	160
Mathematics (Females)	1	48
Science	1	56
Social Sciences and Studies	5	164
College (n.e.c.)	5	152
English (Females)	5	154
Foreign Language (Females)	5	158
Mathematics	1	46
Science	1	54
Social Sciences and Studies	5	162
Specialists		
Teacher of Handicapped (Females)	4	130
Home Economics (Females)	4	132
Physical Education (Females)	4	134
Art (Females)	6	176
Music (Females)	6	178
Techician - Laboratory/Biological Science, Dental, Medical (Females)	7	198
Technician - Laboratory/Physical Science, Engineering, etc.	7	200
Technologist/Medical, Dental (Females)	7	210
Telegraph Operator	11	288
Telephone Installer (repairman)	9	256
Telephone Operator (PBX) (Females)	11	290
Telephone Repairman (including installers)	9	256
Teletype Operator	11	288
Theater Worker	6	180
Therapist - Physical (Physiotherapist) (Females)	7	204
Therapist - Specialized (Misc.) (Females)	7	206
Truck Driver	12	308
Typist (Females)	11	302
Veterinarian	2	72
Vocational/Educational Guidance (Females)	4	118
Wildlife/Conservation Specialist	2	74
Writer (Females)	5	166
Zoologist, Biologist	2	62

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*n.e.c. means "not elsewhere classified"

APPENDIX D

HIGHEST AND LOWEST OCCUPATIONS FOR EACH SCALE

INTEREST SCALES: 25 HIGHEST OCCUPATIONS*

P701. Physical Science, Engineering, Math

Occupation	Career Group	Mean %ile
Physicist	1	90
Chemical Engineer	1	89
Aerospace Engineer	1	86
Teacher--Math, H.S. (Females)	1	86
Chemist	1	84
Electrical Engineer	1	84
Mechanical Engineer	1	83
Teacher--Science, College	1	83
Technologist/Medical, Dental (Females)	7	83
Engineer (N.E.C.)	1	82
Geologist	1	82
Teacher--Math, College	1	82
Mathematician, Statistician	1	81
Civil Engineer	1	79
Physical Scientist (N.E.C.)	1	77
Specialized Therapist/Misc. (Females)	7	77
Physician	2	76
Military Officer	3	74
Teacher--English, College (Females)	5	74
Guidance Counseling (Females)	4	73
Teacher--Foreign Language, College (Females)	5	73
Dental Hygienist (Females)	7	73
Guidance--Vocational/Educational (Females)	4	72
Architect	1	71
Librarian (Females)	5	71

*When there were fewer than 25 occupations averaging above the 60th percentile, only those above the 60th percentile were included in the table.

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P702. Biological Science, Medicine

Occupation	Career Group	Mean %ile
Physician	2	89
Dentist	2	83
Nurse (Females)	2	82
Technologist/Medical, Dental (Females)	7	82
Teacher--Science, College	1	81
Biologist, Zoologist	2	77
Pharmacist	2	77
Dental Hygienist (Females)	7	77
Physical Therapist (Females)	7	77
Psychologist	5	74
Teacher--Science, High School	1	73
Chemist	1	72
Chemical Engineer	1	72
Lab Technician/Bio. Sci., Dental, Medical (Females)	7	72
Specialized Therapist/Misc. (Females)	7	72
Veterinarian	2	70
Nurse/Practical (Females)	12	70
Teacher--Math, College	1	68
Physicist	1	68
Guidance--Vocational/Educational (Females)	4	68
Teacher--Handicapped (Females)	4	68
Teacher--English, College (Females)	5	68
Teacher--Social Science, College	5	67
Guidance Counseling (Females)	4	66
Lawyer	5	66

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P703. Public Service

Occupation	Career Group	Mean %ile
Lawyer	5	76
Teacher--English, College (Females)	5	74
Guidance--Vocational/Educational (Females)	4	71
Teacher--Social Science, College	5	71
Guidance Counseling (Females)	4	70
Stockbroker	3	69
Journalist, Reporter	5	69
Social Worker	4	68
Diplomat	5	67
Teacher--Math, High School (Females)	1	66
Teacher--High School (N.E.C.) (Females)	4	66
Social Scientist	5	66
Teacher--English, High School (Females)	5	66
Writer (Females)	5	66
Teacher (N.E.C.) (Females)	4	64
Teacher--Handicapped (Females)	4	64
Teacher--Foreign Language, College (Females)	5	64
Specialized Therapist/Misc. (Females)	7	64
Physician	2	63
Investment Consultant	3	63
Retail Buyer (Females)	3	63
Economist	5	63
Librarian (Females)	5	63
Teacher--College (N.E.C.) (Females)	5	63
Dentist	2	62
Teacher--Foreign Language, High School (Females)	5	62
Clerk--Bank	11	62

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P704. Literary-Linguistic

Occupation	Career Group	Mean %ile
Teacher--English, College (Females)	5	88
Teacher--Social Science, College	5	82
Writer (Females)	5	82
Teacher--Foreign Language, College (Females)	5	80
Journalist, Reporter	5	79
Teacher--College (N.E.C.)	5	78
Teacher--English, High School (Females)	5	78
Teacher--Mathematics, College	1	77
Diplomat	5	76
Lawyer	5	76
Theater Worker	6	75
Guidance Counseling (Females)	4	74
Stockbroker	3	73
Clergyman	4	73
Librarian (Females)	5	73
Physician	2	72
Specialized Therapist/Misc. (Females)	7	72
Teacher--Science, College	1	71
Guidance--Vocational/Educational (Females)	4	71
Teacher--High School (Females)	4	70
Psychologist	5	70
Teacher--Foreign Language, High School (Females)	5	69
Teacher--Social Science, High School	5	69
Social Worker	4	68
Teacher--Music (Females)	6	68

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P705. Social Service

Occupation	Career Group	Mean %ile
Clergyman	4	85
Teacher--Social Science, High School	5	71
Teacher--College (N.E.C.)	5	69
Teacher--Mathematics, High School (Females)	1	68
Teacher--Social Science, College	5	67
Teacher--Elementary (Females)	4	66
Teacher--Handicapped (Females)	4	66
Teacher--Science, College	1	65
Guidance--Vocational/Educational (Females)	4	63
Social Scientist	5	63
Teacher--Music (Females)	6	63
Teacher (N.E.C.) (Females)	4	62
Teacher--Mathematics, College	1	61
Physician	2	61
Teacher--Science, High School	1	60
Teacher--Preschool (Females)	4	60
Teacher--English, High School (Females)	5	60
Dental Hygienist (Females)	7	60
Specialized Therapist/Misc. (Females)	7	60

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P706. Artistic

Occupation	Career Group	Mean %ile
Commercial Artist	6	92
Teacher--Art (Females)	6	91
Artist/Painter, Sculptor (Females)	6	85
Architect	1	82
Teacher--English, College (Females)	5	79
Writer (Females)	5	76
Theater Worker	6	74
Teacher--Foreign Language, College (Females)	5	70
Photographer	7	69
Teacher--College (N.E.C.)	5	68
Specialized Therapist/Misc. (Females)	7	68
Advertising Worker	3	68
Teacher--Music (Females)	6	66
Teacher--English, High School (Females)	5	65
Stockbroker	3	64
Teacher--Preschool (Females)	4	64
Librarian (Females)	5	64
Draftsman	7	64
Physical Scientist (N.E.C.)	1	63
Retail Buyer (Females)	3	63
Guidance Counseling (Females)	4	63
Guidance--Vocational/Educational (Females)	4	63
Social Worker (Females)	4	62
Teacher--High School (Females)	4	62
Aerospace Engineer	1	61
Teacher--Home Economics (Females)	4	61

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P707. Musical

Occupation	Career Group	Mean %ile
Musician/Instrumental	6	93
Teacher--Music (Females)	6	92
Teacher--Foreign Language, College (Females)	5	75
Teacher--English, College (Females)	5	73
Teacher--College (N.E.C.)	5	72
Theater Worker	6	72
Psychologist	5	71
Writer (Females)	5	71
Commercial Artist	6	70
Clergyman	4	69
Teacher--Mathematics, College	1	68
Physician	2	68
Teacher--Social Science, College	5	68
Photographer	7	68
Specialized Therapist/Misc. (Females)	7	68
Teacher--Science, College	1	67
Teacher--English, High School (Females)	5	67
Librarian (Females)	5	66
Teacher--Art (Females)	6	66
Architect	1	65
Journalist, Reporter	5	65
Guidance Counseling (Females)	4	64
Guidance--Vocational/Educational (Females)	4	64
Teacher--Preschool (Females)	4	63
Teacher--Foreign Language, High School (Females)	5	62

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P710. Business Management

Occupation	Career Group	Mean %ile
Stockbroker	3	69
Guidance--Vocational/Educational (Females)	4	64
Guidance Counseling (Females)	4	63
Lawyer	5	63
Investment Consultant	3	62
Teacher--Commercial Education (Females)	3	60
Teacher--English, College (Females)	5	60
Manager/Sales	8	60

P711. Sales

Occupation	Career Group	Mean %ile
Manager/Sales	8	64
Auto Salesman	8	64
Investment Consultant	3	63
Advertising Worker	3	62
Stockbroker	3	62
Salesman--Other (N.E.C.)	8	62
Receptionist, Hotel Clerk, etc. (Females)	11	61
Purchasing Agent	3	60
Teacher--Commercial Education (Females)	3	60
Teacher--English, College (Females)	5	60
Salesman--Real Estate	8	60
Clerk--Bank	11	60

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P712. Computation

Occupation	Career Group	Mean %ile
Teacher--Mathematics, High School (Females)	1	79
Certified Public Accountant	3	79
Accountant, Auditor, Comptroller	3	74
Teacher--Commercial Education (Females)	3	71
Mathematician, Statistician	1	69
Teacher--Mathematics, College	1	68
Bookkeeper (Females)	11	68
Account Recording Worker/Misc. (Females)	11	66
Clerk--Bank	11	64
Physicist	1	63
Computer Programmer	7	63
Aerospace Engineer	1	62
Physical Scientist (N.E.C.)	1	61
Keypunch Operator (Females)	11	61
Engineer (N.E.C.)	1	60
Efficiency Expert	3	60
Purchasing Agent	3	60
Computer/EAM Operator, Supervisor	7	60

P713. Office Work

Occupation	Career Group	Mean %ile
Stenographer, etc. (Females)	11	64
Accountant, Auditor, Comptroller	3	63
Clerical Worker/Misc.	11	63
Certified Public Accountant	3	62
Teacher--Commercial Education (Females)	3	62
Purchasing Agent	3	61

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P714. Mechanical-Technical

Occupation	Career Group	Mean %ile
Teacher--Mathematics, High School (Females)	1	73
Auto Mechanic	9	73
Technologist/Medical, Dental (Females)	7	70
Machinist	9	69
Mining, Quarrying, etc.	10	68
Mechanical Engineer	1	67
Electronics Worker (N.E.C.)	7	67
Airplane Mechanic	9	67
Mechanic--Other (N.E.C.)	9	67
Repairman--Appliance	9	66
Metal Worker	9	65
Repairman--Industrial Machine	9	65
Lab Technician/Bio. Sci., Dental, Medical (Females)	7	64
Bricklayer, Mason, etc.	10	64
Electrician (N.E.C.)	9	63
Repairman--Office Machine	9	63
Nurse/Practical (Females)	12	63
Dental Hygienist (Females)	7	62
Physical Therapist (Females)	7	62
Operator--Telephone (PBX) (Females)	11	62
Electrical Engineer	1	61
Repair Serviceman--Computer	7	61
Draftsman	7	61
Electronics Technician	7	61
Building Construction/Misc.	10	61
Carpenter	10	61
Foreman (N.E.C.)	10	61
Military/Enlisted	12	61

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P715. Skilled Trades

Occupation	Career Group	Mean %ile
Bricklayer, Mason	10	70
Carpenter	10	70
Mechanic--Other (N.E.C.)	9	69
Metal Worker	9	69
Mining, Quarrying, etc.	10	68
Building Construction/Misc.	10	67
Butcher, Meat Cutter	12	66
Laborer/General	12	66
Auto Mechanic	9	65
Teacher--Home Economics (Females)	4	64
Clerk/Sales (Females)	8	64
Clothing, Fashion Trades (Females)	9	64
Machinist	9	64
Repairman--Industrial Machine	9	64
Plumber, Pipefitter	10	64
Telephone Operator (PBX) (Females)	11	64
Farming/Ranching--Other (N.E.C.)	12	64
Hairdresser (Females)	12	64
Military/Enlisted	12	64
Teacher--Preschool (Females)	4	63
Farming/Ranching--Owner	8	63
Auto, Bus, Truck Driver	12	63
Nurse/Practical (Females)	12	63
Dental Hygienist (Females)	7	62
Foreman (N.E.C.)	10	62
Clerk--Misc. (Females)	11	62

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P716. Farming

Occupation	Career Group	Mean %ile
Agricultural Specialist	2	81
Wildlife/Conservation Specialist	2	74
Teacher--Physical Education	4	70
Mining, Quarrying, etc.	10	70
Veterinarian	2	67
Physical Therapist (Females)	7	65
Auto, Bus, Truck Driver	12	65
Writer (Females)	5	64
Teacher--Art (Females)	6	64
Repairman--Office Machine	9	64
Heavy Equipment Operator	10	64
Account Recording Worker/Misc. (Females)	11	64
Teacher--Preschool (Females)	4	63
Artist/Painter, Sculptor (Females)	6	63
Specialized Therapist/Misc. (Females)	7	63
Mechanic--Other (N.E.C.)	9	63
Building Construction/Misc.	10	63
Nurse (Females)	2	62
Teacher--High School (Females)	4	61
Teacher--Home Economics (Females)	4	61
Lab Technician/Bio. Sci., Medical, Dental (Females)	7	61
Metal Worker	9	61
Carpenter	10	61
Nurse/Practical (Females)	12	61
Guidance--Vocational/Educational (Females)	4	60
Teacher--Elementary (Females)	4	60
Librarian (Females)	5	60
Teacher--Foreign Language, College (Females)	5	60
Dental Hygienist (Females)	7	60
Surveyor	7	60
Clothing, Fashion Trades (Females)	9	60
Mechanic--Airplane	9	60
Butcher, Meat Cutter	12	60

INTEREST SCALES: 25 HIGHEST OCCUPATIONS

P717. Labor

Occupation	Career Group	Mean %ile
Auto, Bus, Truck Driver	12	68
Repairman--Industrial Machine	9	67
Laborer/General	12	67
Clerk/Sales (Females)	8	66
Metal Worker	9	66
Mechanic--Auto	9	65
Repairman--Office Machine	9	65
Mechanic--Other (N.E.C.)	9	64
Mining, Quarrying	10	64
Plumber, Pipefitter	10	64
Military/Enlisted	12	64
Bricklayer, Mason, etc.	10	63
Building Construction/Misc.	10	63
Carpenter	10	63
Telephone Operator (PBX) (Females)	11	63
Mechanic--Airplane	9	62
Foreman (N.E.C.)	10	62
Clerk--Misc. (Females)	11	62
Operator--Keypunch (Females)	11	62
Nurse/Practical (Females)	12	62
Farming/Ranching--Other (N.E.C.)	12	61
Hairdresser (Females)	12	61
Farming/Ranching--Owner	8	60
Clothing, Fashion Trades (Females)	9	60
Clerical Worker (Misc.)	11	60
Typist (Females)	11	60
Butcher, Meat Cutter	12	60
Fireman	12	60

INFORMATION TEST: 25 HIGHEST OCCUPATIONS*

R102. Vocabulary

Occupation	Career Group	Mean %ile
Teacher--English, College (Females)	5	91
Teacher--Foreign Language, College (Females)	5	88
Physician	2	87
Writer (Females)	5	86
Chemical Engineer	1	85
Teacher--Math, H.S. (Females)	1	84
Librarian (Females)	5	84
Teacher--Math, College	1	83
Teacher--Science, College	1	83
Teacher--Social Studies, College	5	83
Guidance Counseling (Females)	4	82
Teacher--Foreign Language, H.S. (Females)	5	82
Chemist	1	81
Physicist	1	81
Teacher--College (N.E.C.)	5	81
Teacher--English, H.S. (Females)	5	81
Physical Therapist	7	81
Guidance--Vocational/Educational (Females)	4	80
Teacher--Art (Females)	6	80
Mechanical Engineer	1	79
Mathematician, Statistician	1	79
Investment Consultant	3	79
Engineer (N.E.C.)	1	78
Physical Scientist (N.E.C.)	1	78
Dentist	2	78
Teacher--High School (N.E.C.)	4	78
Lawyer	5	78
Psychologist	5	78
Technologist/Medical, Dental (Females)	7	78

*Only those occupations averaging above the 60th percentile were included in these tables. When there were fewer than 25 occupations averaging above the 60th percentile, only those above the 60th percentile were included in the table.

INFORMATION TEST: 25 HIGHEST OCCUPATIONS

R103. Literature

Occupation	Career Group	Mean %ile
Teacher--English, College (Females)	5	92
Teacher--Foreign Language, College (Females)	5	91
Teacher--Social Science, College	5	87
Writer (Females)	5	87
Teacher--Mathematics, College	1	87
Physician	2	86
Physical Scientist (N.E.C.)	1	85
Teacher--Foreign Language, High School (Females)	5	85
Teacher--Science, College	1	84
Diplomat	5	84
Librarian (Females)	5	84
Teacher--English, High School (Females)	5	84
Lawyer	5	83
Chemical Engineer	1	82
Physicist	1	82
Guidance--Vocational/Educational (Females)	4	82
Psychologist	5	82
Teacher--College (N.E.C.)	5	82
Teacher--Art (Females)	6	82
Theater Worker	6	81
Chemist	1	80
Teacher--Mathematics, High School (Females)	1	80
Advertising Worker	3	80
Guidance Counseling (Females)	4	80
Teacher--High School (Females)	4	80
Journalist, Reporter	5	80
Physical Therapist (Females)	7	80

INFORMATION TEST: 25 HIGHEST OCCUPATIONS

R104. Music

Occupation	Career Group	Mean %ile
Teacher--English, College (Females)	5	87
Teacher--Foreign Language, College (Females)	5	87
Musician/Instrumental	6	87
Teacher--Music (Females)	6	87
Teacher--Mathematics, College	1	85
Teacher--Science, College	1	84
Physician	2	83
Teacher--College (N.E.C.)	5	82
Teacher--Social Science, College	5	82
Theater Worker	6	82
Guidance--Vocational/Educational (Females)	4	80
Diplomat	5	80
Lawyer	5	80
Librarian (Females)	5	80
Psychologist	5	80
Teacher--English, High School (Females)	5	80
Teacher--Foreign Language, High School (Females)	5	79
Writer (Females)	5	79
Investment Consultant	3	78
Teacher--Art (Females)	6	78
Physical Therapist (Females)	7	78
Specialized Therapist/Misc. (Females)	7	78
Mathematician, Statistician	1	77
Physicist	1	77
Business Administration and Management (N.E.C.)	3	77
Social Scientist	5	77

INFORMATION TEST: 25 HIGHEST OCCUPATIONS

R105. Social Studies

Occupation	Career Group	Mean %ile
Teacher--Foreign Language, College (Females)	5	90
Teacher--Art (Females)	6	88
Teacher--Mathematics, College	1	87
Teacher--English, College (Females)	5	87
Teacher--Foreign Language, High School (Females)	5	87
Teacher--Social Science, College	5	86
Diplomat	5	85
Teacher--Science, College	1	84
Librarian (Females)	5	84
Physician	2	83
Teacher--English, High School (Females)	5	82
Writer (Females)	5	82
Teacher--Mathematics, High School (Females)	1	81
Physicist	1	81
Teacher--High School (Females)	4	81
Chemical Engineer	1	80
Lawyer	5	80
Physical Therapist (Females)	7	80
Chemist	1	79
Teacher--College (N.E.C.)	5	79
Geologist	1	78
Military Officer	3	78
Economist	5	78
Mathematician, Statistician	1	77
Physical Scientist (N.E.C.)	1	77
Guidance--Vocational/Educational (Females)	4	77
Social Worker (Females)	4	77
Teacher--Preschool (Females)	4	77

INFORMATION TEST: 25 HIGHEST OCCUPATIONS

R106. Mathematics

Occupation	Career Group	Mean %ile
Teacher--Mathematics, College	1	94
Mathematician, Statistician	1	92
Teacher--Mathematics, High School (Females)	1	92
Physicist	1	92
Teacher--Foreign Language, College (Females)	5	92
Teacher--College, English (Females)	5	91
Chemical Engineer	1	90
Teacher--Science, College	1	90
Physical Scientist (N.E.C.)	1	89
Physician	2	89
Physical Therapist (Females)	7	88
Teacher--Foreign Language, High School (Females)	5	87
Chemist	1	87
Aerospace Engineer	1	86
Electrical Engineer	1	86
Guidance--Vocational/Educational (Females)	4	86
Engineer (N.E.C.)	1	85
Mechanical Engineer	1	85
Guidance Counseling (Females)	4	85
Technologist/Medical, Dental (Females)	7	84
Dentist	2	84
Lawyer	5	84
Writer (Females)	5	84
Teacher--English, High School (Females)	5	84
Civil Engineer	1	83
Military Officer	3	83
Diplomat	5	83
Teacher--Social Science, College	5	83

INFORMATION TEST: 25 HIGHEST OCCUPATIONS

R107. Physical Science

Occupation	Career Group	Mean %ile
Physicist	1	90
Physical Scientist (N.E.C.)	1	89
Teacher--Science, College	1	89
Chemical Engineer	1	88
Teacher--Mathematics, College	1	88
Mathematician, Statistician	1	86
Teacher--Mathematics, High School (Females)	1	86
Physician	2	86
Chemist	1	85
Geologist	1	85
Teacher--Foreign Language, College (Females)	5	85
Teacher--English, College (Females)	5	85
Electrical Engineer	1	84
Writer (Females)	5	83
Technologist/Medical, Dental (Females)	7	83
Engineer (N.E.C.)	1	82
Aerospace Engineer	1	82
Veterinarian	2	82
Teacher--Foreign Language, High School (Females)	5	82
Physical Therapist (Females)	7	82
Mechanical Engineer	1	81
Guidance--Vocational/Educational (Females)	4	80
Teacher--High School (Females)	4	80
Librarian (Females)	5	80
Teacher--English, High School (Females)	5	80

INFORMATION TEST: 25 HIGHEST OCCUPATIONS

R108. Biological Science

Occupation	Career Group	Mean %ile
Teacher--English, College (Females)	5	85
Physical Scientist (N.E.C.)	1	83
Teacher--Science, College	1	82
Writer (Females)	5	82
Physical Therapist (Females)	7	82
Chemist	1	80
Chemical Engineer	1	80
Physicist	1	80
Biologist, Zoologist	2	79
Physician	2	79
Teacher--Foreign Language, College (Females)	5	79
Teacher--Art (Females)	6	78
Veterinarian	2	77
Wildlife/Conservation Specialist	2	77
Teacher--Mathematics, College	1	76
Teacher--Science, High School	1	76
Guidance--Vocational/Educational (Females)	4	76
Teacher--High School (Females)	4	76
Librarian (Females)	5	76
Teacher--English, High School (Females)	5	76
Technologist/Medical, Dental (Females)	7	76
Geologist	1	75
Dentist	2	75
Teacher--Mathematics, High School (Females)	1	74
Military Officer	3	74
Teacher--College (N.E.C.)	5	74
Artist/Painter, Sculptor, etc. (Females)	6	74

ABILITY TEST: 25 HIGHEST AND 25 LOWEST OCCUPATIONS

R230. Total English

Occupation	Career Group	Mean %ile
Highest		
Teacher--Math, College	1	93
Teacher--English, College (Females)	5	92
Teacher--Foreign Language, College (Females)	5	90
Physician	2	88
Teacher--Science, College	1	87
Teacher--College (N.E.C.)	5	86
Teacher--Foreign Language, H.S. (Females)	5	86
Chemical Engineer	1	86
Mathematician, Statistician	1	86
Physicist	1	86
Lawyer	5	85
Teacher--English, H.S. (Females)	5	84
Teacher--Social Studies, College	5	84
Teacher--Math, H.S. (Females)	1	83
Physicial Scientist	1	83
Diplomat	5	83
Journalist, Reporter	5	82
Librarian (Females)	5	82
Dentist	2	81
Clergyman	4	81
Psychologist	5	81
Writer (Females)	5	81
Chemist	1	81
Aerospace Engineer	1	79
Guidance--Vocational/Educational (Females)	4	79
Lowest		
Bricklayer, Mason, etc.	10	27
Mining, Quarrying	10	29
Butcher/Meat Cutter	12	29
Clerk/Sales (Females)	8	30
Carpenter	10	30
Heavy Equipment Operator	10	30
Auto, Bus, Truck Driver	12	30
Auto Mechanic	9	31
Metal Worker	9	31
Fireman	12	31
Laborer/General	12	31
Airplane Mechanic	9	34
Plumber, Pipefitter	10	34
Radio, Telegraph, Teletype Operator	11	34
Electrician (N.E.C.)	9	35
Building Construction (Misc.)	10	36
Keypunch Operator (Females)	11	36
Hairdresser (Females)	12	36
Printing Trades	9	38
Military/Enlisted	12	38
Clothing/Fashion Trades (Females)	9	39
Clerical Worker/Misc.	11	39
Farming/Ranching: Owner	8	39
Machinist	9	41
Foreman (N.E.C.)	10	41
Receptionist, Hotel Clerk (Females)	11	41
Typist (Females)	11	41
Nurse/Practical (Females)	12	41

ABILITY TEST: 25 HIGHEST AND 25 LOWEST OCCUPATIONS

R250. Reading Comprehension

Occupation	Career Group	Mean %ile
Highest		
Teacher--English, College (Females)	5	92
Teacher--Mathematics, College	1	87
Physicist	1	86
Teacher--Foreign Language, College (Females)	5	85
Chemical Engineer	1	84
Physician	2	84
Teacher--Social Studies, College	5	84
Guidance Counseling (Females)	4	83
Teacher--Foreign Language, High School (Females)	5	83
Teacher--Science, College	1	82
Lawyer	5	82
Teacher--English, High School (Females)	5	82
Writer (Females)	5	82
Librarian (Females)	5	80
Mathematician, Statistician	1	79
Psychologist	5	79
Teacher--College (N.E.C.)	5	79
Chemist	1	78
Teacher--Mathematics, High School (Females)	1	78
Physical Scientist	1	78
Diplomat	5	78
Physical Therapist	7	78
Engineer (N.E.C.)	1	77
Teacher--High School (N.E.C.) (Females)	4	77
Geologist	1	76
Veterinarian	2	76
Guidance--Vocational/Educational (Females)	4	76
Journalist, Reporter	5	76
Lowest		
Mining, Quarrying	10	28
Metal Worker	9	29
Carpenter	10	29
Auto, Bus, Truck Driver	12	30
Bricklayer, Mason, etc.	10	31
Laborer/General	12	31
Clerk/Sales (Females)	8	32
Heavy Equipment Operator	10	32
Plumber, Pipefitter	10	32
Mechanic--Other (N.E.C.)	9	33
Mechanic--Auto	9	34
Farming/Ranching--Other (N.E.C.)	12	34
Butcher/Meat Cutter	12	35
Radio, Telegraph, Teletype Operator	11	36
Printing Trades	9	37
Farming/Ranching: Owner	8	38
Repairman--Industrial Machine	9	38
Building Construction: Misc.	10	38
Clothing/Fashion Trades (Females)	9	39
Clerk--Misc. (Females)	11	39
Hairdresser (Females)	12	39
Clerical Worker (Misc.) (Females)	11	40
Keypunch Operator (Females)	11	40
Telephone Operator (PBX) (Females)	11	40
Supervisor/Business	8	41

ABILITY TEST: 25 HIGHEST AND 25 LOWEST OCCUPATIONS

R260. Creativity

Occupation	Career Group	Mean %ile
Highest		
Teacher--Science, College	1	83
Teacher--Foreign Language, College	5	83
Teacher--English, College	5	82
Physicist	1	80
Aerospace Engineer	1	79
Teacher--Mathematics, College	1	79
Physical Scientist (N.E.C.)	1	79
Guidance--Vocational/Educational (Females)	4	79
Architect	1	78
Teacher--Mathematics, High School (Females)	1	78
Geologist	1	78
Physician	2	78
Military Officer	3	78
Writer (Females)	5	78
Engineer (N.E.C.)	1	77
Chemical Engineer	1	77
Electrical Engineer	1	77
Biologist, Zoologist	2	77
Mechanical Engineer	1	76
Teacher--English, High School (Females)	5	76
Teacher--Social Studies, College	5	76
Teacher--College (N.E.C.)	5	76
Teacher--Art (Females)	6	76
Physical Therapist (Females)	7	76
Chemist	1	75
Mathematician, Statistician	1	75
Veterinarian	2	75
Lawyer	5	75
Psychologist	5	75
Lowest		
Clerk/Sales (Females)	8	35
Mining, Quarrying, etc.	10	38
Butcher/Meat Cutter	12	38
Salesman--Auto	8	40
Heavy Equipment Operator	10	40
Radio, Telegraph, Teletype Operator	11	40
Laborer/General	12	40
Auto, Bus, Truck Driver	12	41
Metal Worker	9	42
Telephone Operator (PBX) (Females)	11	42
Typist (Females)	11	43
Bricklayer, Mason, etc.	10	44
Building Construction (Misc.)	10	44
Plumber, Pipefitter	10	44
Clerical Worker/Misc.	11	44
Industrial Machine Repairman	9	45
Carpenter	10	45
Clerical Worker/Misc.	12	45
Farming/Ranching: Owner	8	46
Clerk/Misc. (Females)	11	46
Clothing, Fashion Trades (Females)	9	47
Mechanic--Airplane	9	47
Keypunch Operator (Females)	11	47
Fireman	12	47
Electrician (N.E.C.)	9	48
Hairdresser (Females)	12	48

ABILITY TEST: 25 HIGHEST AND 25 LOWEST OCCUPATIONS

R270. Mechanical Reasoning

Occupation	Career Group	Mean %ile
Highest		
Physicist	1	87
Teacher--Mathematics, High School (Females)	1	84
Physical Therapist	7	82
Aerospace Engineer	1	81
Teacher--Foreign Language, College (Females)	5	81
Teacher--English, College (Females)	5	80
Teacher--Art (Females)	6	80
Electrical Engineer	1	79
Geologist	1	79
Mechanical Engineer	1	78
Artist, Painter, Sculptor (Females)	6	78
Chemical Engineer	1	77
Physical Scientist	1	77
Engineer (N.E.C.)	1	76
Theater Worker	6	76
Medical/Dental Technologist (Females)	7	76
Chemist	1	75
Writer (Females)	5	75
Architect	1	74
Civil, Hydraulic Engineer	1	74
Teacher--Science, College	1	74
Pilot	3	74
Repair Serviceman	7	74
Veterinarian	2	73
Wildlife/Conservation Specialist	2	73
Military Officer	3	73
Guidance--Vocational/Educational (Females)	4	73
Teacher--Foreign Language, High School (Females)	5	73
Specialized Therapist/Misc. (Females)	7	73
Lowest		
Butcher, Meat Cutter	12	37
Mining, Quarrying	10	38
Clerical Worker/Misc.	11	38
Laborer/General	12	38
Auto, Bus, Truck Driver	12	40
Bricklayer, Mason, etc.	10	41
EAM Operator, Supervisor	7	42
Heavy Equipment Operator	10	42
Auto Salesman	8	43
Finance Worker	3	44
Clerk/Sales (Females)	8	44
Printing Trades	9	44
Radio, Telegraph, Teletype Operator	11	44
Supervisor/Business	8	45
Metal Worker	9	45
Plumber, Pipefitter	10	45
Fireman	12	45
Policeman	12	45
Telephone Operator (PBX) (Females)	11	46
Accountant, Auditor, Comptroller	3	47
Journalist, Reporter	5	47
Teacher--Social Science, High School	5	47
Insurance Salesman	8	47
Building Construction/Misc.	10	47
Carpenter	10	47
Military/Enlisted	12	47

ABILITY TEST: 25 HIGHEST AND 25 LOWEST OCCUPATIONS

R282. Visualization in 3D

Occupation	Career Group	Mean %ile
Highest		
Teacher--Mathematics, High School (Females)	1	84
Architect	1	83
Physicist	1	82
Physical Scientist	1	80
Artist, Painter, Sculptor (Females)	6	80
Aerospace Engineer	1	79
Mechanical Engineer	1	78
Geologist	1	78
Physical Therapist (Females)	7	77
Chemical Engineer	1	76
Electrical Engineer	1	76
Teacher--Mathematics, College	1	76
Teacher--Art (Females)	6	76
Engineer (N.E.C.)	1	75
Civil Engineer	1	74
Teacher--Science, College	1	74
Teacher--English, College (Females)	5	74
Teacher--Home Economics (Females)	4	74
Mathematician, Statistician	1	73
Dentist	2	72
Teacher--Foreign Language, College (Females)	5	72
Chemist	1	71
Military Officer	3	71
Teacher--Foreign Language, High School (Females)	5	70
Theater Worker	6	70
Dental Hygienist (Females)	7	70
Technologist/Medical, Dental (Females)	7	70
Lowest		
Auto Salesman	8	36
Clerical Worker/Misc.	11	37
Butcher, Meat Cutter	12	40
Laborer/General	12	40
Auto, Bus, Truck Driver	12	41
Mining, Quarrying	10	41
Heavy Equipment Operator	10	42
Plumber, Pipefitter	10	43
Bricklayer, Mason, etc.	10	44
EAM Operator, Supervisor	7	45
Clerk/Sales (Females)	8	45
Printing Trades	9	45
Radio, Telegraph, Teletype Operator	11	45
Fireman	12	45
Policeman	12	45
Advertising Worker	3	46
Metal Worker	9	46
Telephone Operator (PBX) (Females)	11	46
Industry, Business, Commerce (N.E.C.)	3	47
Supervisor/Business	8	47
Farming/Ranching: Other (N.E.C.)	12	47
Farming/Ranching: Owner	8	48
Building Construction/Misc.	10	48
Keypunch Operator (Females)	11	48
Typist (Females)	11	48

ABILITY TEST: 25 HIGHEST AND 25 LOWEST OCCUPATIONS

R290. Abstract Reasoning

Occupation	Career Group	Mean %ile
	Highest	
Physicist	1	84
Teacher--Mathematics, College	1	83
Teacher--Mathematics, High School (Females)	1	83
Teacher--Foreign Language, College (Females)	5	83
Aerospace Engineer	1	81
Mathematician, Statistician	1	81
Chemical Engineer	1	79
Physical Therapist (Females)	7	79
Engineer (N.E.C.)	1	78
Mechanical Engineer	1	78
Electrical Engineer	1	77
Physician	2	77
Teacher--English, College (Females)	5	77
Architect	1	76
Chemist	1	76
Veterinarian	2	76
Teacher--College (N.E.C.)	5	76
Teacher--Foreign Language, High School (Females)	5	76
Civil Engineer	1	75
Teacher--Art (Females)	6	75
Teacher--Science, College	1	74
Dentist	2	74
Psychologist	5	74
Teacher--English, High School (Females)	5	73
Geologist	1	72
Physical Scientist	1	72
Teacher--Science, High School	1	72
Wildlife/Conservation Specialist	2	72
Military Officer	3	72
	Lowest	
Clerk/Sales (Females)	8	29
Bricklayer, Mason, etc.	10	31
Radio, Telegraph, Teletype Operator	11	31
Laborer/General	12	31
Auto Salesman	8	32
Heavy Equipment Operator	10	32
Mining, Quarrying, etc.	10	32
Butcher, Meat Cutter	12	34
Auto, Bus, Truck Driver	12	34
Metal Worker	9	35
Mechanic--Other (N.E.C.)	9	37
Building Construction/Misc.	10	39
Clothing, Fashion Trades (Females)	9	40
Airplane Mechanic	9	40
Appliance Repairman	9	40
Plumber, Pipefitter	10	40
Keypunch Operator (Females)	11	40
Typist (Females)	11	40
Clerical Worker/Misc.	11	41
Farming, Ranching: Other (N.E.C.)	12	41
Fireman	12	41
Auto Mechanic	9	42
Printing Trades	9	42
Clerk--Misc. (Females)	11	42
Telephone Operator (PBX) (Females)	11	42
Nurse/Practical (Females)	12	42

ABILITY TEST: 25 HIGHEST AND 25 LOWEST OCCUPATIONS

R311. Arithmetic Reasoning

Occupation	Career Group	Mean %ile
Highest		
Teacher--Mathematics, College	1	89
Physicist	1	89
Teacher--Mathematics, High School (Females)	1	88
Teacher--Foreign Language, College (Females)	5	88
Teacher--English, College (Females)	5	87
Chemical Engineer	1	84
Mathematician, Statistician	1	83
Physician	2	83
Engineer (N.E.C.)	1	82
Mechanical Engineer	1	82
Teacher--Science, College	1	82
Chemist	1	80
Veterinarian	2	80
Teacher--Foreign Language, High School (Females)	5	80
Physical Therapist (Females)	7	80
Electrical Engineer	1	79
Investment Consultant	3	79
Lawyer	5	79
Teacher--Social Science, College	5	79
Aerospace Engineer	1	78
Guidance Counseling (Females)	4	78
Teacher--English, High School (Females)	5	78
Writer (Females)	5	78
Geologist	1	77
Dentist	2	77
Military Officer	3	77
Teacher--College (N.E.C.)	5	77
Technologist/Medical, Dental (Females)	7	77
Lowest		
Auto, Bus, Truck Driver	12	34
Clerk/Sales (Females)	8	35
Radio, Telegraph Operator	11	35
Airplane Mechanic	9	37
Metal Worker	9	37
Heavy Equipment Operator	10	38
Laborer/General	12	38
Military/Enlisted	12	38
Butcher, Meat Cutter	12	39
Printing Trades	9	40
Keypunch Operator (Females)	11	42
Mechanic--Other (N.E.C.)	9	43
Building Construction/Misc.	10	43
Mining, Quarrying	10	43
Plumber, Pipefitter	10	43
Fireman	12	43
Bricklayer, Mason	10	44
Carpenter	10	44
Telephone Operator (PBX) (Females)	11	44
Typist (Females)	11	44
Auto Mechanic	9	45
Clerical Worker/Misc.	11	46
Commercial Artist	6	47
Supervisor/Business	8	47
Electrician (N.E.C.)	9	47
Foreman (N.E.C.)	10	47

ABILITY TEST: 25 HIGHEST AND 25 LOWEST OCCUPATIONS

R312. Introductory Math

Occupation	Career Group	Mean %ile
Highest		
Teacher--Mathematics, College	1	95
Teacher--Mathematics, High School (Females)	1	94
Physicist	1	92
Chemical Engineer	1	90
Mathematician, Statistician	1	90
Teacher--English, College (Females)	5	90
Teacher--Foreign Language, College (Females)	5	90
Physician	2	89
Teacher--Foreign Language, High School (Females)	5	88
Engineer (N.E.C.)	1	87
Electrical Engineer	1	87
Teacher--Science, College	1	87
Chemist	1	86
Aerospace Engineer	1	86
Civil Engineer	1	85
Mechanical Engineer	1	85
Physical Scientist	1	85
Veterinarian	2	84
Investment Consultant	3	84
Guidance Counseling (Females)	4	84
Guidance--Vocational/Educational (Females)	4	84
Lawyer	5	84
Librarian (Females)	5	84
Physical Therapist (Females)	7	84
Technologist/Medical, Dental (Females)	7	84
Dentist	2	83
Teacher--High School (N.E.C.) (Females)	4	83
Lowest		
Mining, Quarrying, etc.	10	32
Clerk/Sales (Females)	8	34
Auto, Bus, Truck Driver	12	35
Metal Worker	9	37
Heavy Equipment Operator	10	37
Carpenter	10	38
Laborer/General	12	38
Auto Mechanic	9	39
Bricklayer, Mason, etc.	10	40
Radio, Telegraph, Teletype Operator	11	40
Airplane Mechanic	9	41
Printing Trades	9	41
Industrial Machine Repairman	9	41
Butcher, Meat Cutter	12	41
Mechanic--Other (N.E.C.)	9	43
Military/Enlisted	12	43
Telephone Operator (PBX) (Females)	11	44
Fireman	12	45
Electrician (N.E.C.)	9	46
Building Construction/Misc.	10	46
Farming/Ranching: Other (N.E.C.)	12	46
Hairdresser (Females)	12	46
Machinist	9	47
Clerical Worker/Misc.	11	47
Keypunch Operator (Females)	11	47
Policeman	12	47

APPENDIX E
Student's Booklet

Pages 1 through 4 of the **Student's Booklet** are reproduced on the following pages.
Page numbers on this page refer to the **Student's Booklet**. Pages 5 through 16 of the **Student's Booklet** are the same as the second page of each of Chapters 3 through 14 of the **Career Data Book**.

* * *

STUDENT'S BOOKLET
to Accompany Career Data Book

This booklet is to help you compare your own abilities, achievements, interests, and background with those of other young people who went into various occupations.

Ask your counselor for help in getting your percentile rankings. Then enter them on the following page (Page 2).

Your percentile rating on something tells what percent of Americans of your grade and sex are not as good at it as you are, or have less of it than you do. For example, if you are at the 30th percentile in reading comprehension, then 30% of Americans of your grade and sex are not as good at it as you are, and 70% of them are better. If your interest in office work is at the 5th percentile, then office work bores you, because 95% of the people of your age and sex like it better than you do. On the other hand if your percentile rank for interest in office work is 87, then you are more interested in it that 87% of Americans of your grade and sex.

We have chosen the jobs that the most people go into and sorted them into twelve career groups. All the jobs within any one career group are somewhat similar. They take about the same amount of education and similar patterns of abilities, achievements, interests, etc.

You can compare yourself with the people in each of the twelve career groups to find which career group fits you best. To do this, turn to page 4. The numbers on the graph are the numbers of the twelve career groups listed on page 3. They are placed at the average percentile rating of the people in that career group. Put your own percentile rankings on the profile. If you use a red pencil, they will be easier to see. For example, if your percentile ranking for the first of the Interest entries on the profile, Interest in physical science, engineering, and math, is 70, you will put a red cross on the first line of the graph just under the number 70. Do this for all your percentile rankings. Then look to see which of the numbers that represent the career groups is most often next to the red crosses that represent your percentile ranking. For example, if the number 7 often appears near your red crosses, this would be a good career group to start looking for an occupation in.

Now look at page 3 of the book. Career Group 7 is "Technical Positions." Fourteen occupations are listed under it. Each one has a letter before it. To find out which of these fourteen occupations has people in it who are most like you, turn to the profile on page 11 (the profile for Career Group 7). The letters on it correspond to the different occupations listed under Career Group 7, "Technical Positions," on page 3. Now enter your own percentile ratings by making red crosses on the page 11 graph. See which of the letters is most often near your red crosses. Suppose it is the letter "C." By consulting page 3 again you find that this is the letter for computer repair serviceman. Ask your counselor to let you read the description and see the detailed profile of this occupation in the large **Career Data Book.**

If you think this is the wrong occupation for you, look at some of the other letters, and see if there is some other occupation in Career Group 7 in which the workers are a good deal like you.

Or if there is an occupation in some other career group that you are particularly interested in, you can turn to the profile for that career group and enter your percentile rankings there, then see how near they are to the letters that represent the job you are interested in. For example, if you think you might like to be a wildlife or conservation specialist, you can enter your rankings on the profile for Career Group 2 on page 6, and see how near they are to the letter "H" which represents the rankings for wildlife and conservation specialists. Then look at the profile and description for that occupation in the **Career Data Book.**

One thing that you need to know to understand the profiles in the **Career Data Book** is what the horizontal line opposite each listing of interest, information, and abilities means. This bar shows the ranking made by 50% of the people going into the occupation or career group. For example, look at the profile for wildlife and conservation specialists in the counselor's **Career Data Book**. This profile shows the rankings of men who became wildlife and conservation specialists. The horizontal line shows the range of rankings made by the middle 50% of the men who, five years after high school, had either become wildlife and conservation specialists or were preparing to do so. Now look at the scale for information in social studies. The horizontal line extends from the 32nd percentile to the 82nd. So 50% of the men had rankings between the 32nd and the 82nd percentiles. 25% were lower in information regarding social studies than the 32nd percentile, and another 25% were higher than the 82nd percentile. The little vertical mark in the middle of the bar shows that the **average** percentile ranking for information in social studies of men becoming wildlife and conservation specialists is 71, but many are lower and many higher.

Sometimes students want very much to enter a certain occupation but find that some of their percentile rankings are low compared with those of other people who entered that occupation. If this is the case with you, talk to your counselor about it. It may be that your low percentile ratings are in areas that aren't really essential to that occupation. Or they may be in fields where hard work and special training will enable you to raise them.

STUDENT'S ESTIMATED PERCENTILE RANKS

(with supporting evidence)

Name ______________________________

Grade __________ Age __________ Date of estimates __________

INTEREST SCALES	Estimated Percentile Rank	Data/Evidence/Notes
Phys. Sci., Eng., Math.	( )	____________
Bio. Sci., Medicine	( )	____________
Public Service	( )	____________
Literary-Linguistic	( )	____________
Social Service	( )	____________
Artistic	( )	____________
Musical	( )	____________
Sports	( )	____________
Hunting & Fishing	( )	____________
Business Management	( )	____________
Sales	( )	____________
Computation	( )	____________
Office Work	( )	____________
Mechanical-Technical	( )	____________
Skilled Trades	( )	____________
Farming	( )	____________
Labor	( )	____________
INFORMATION TEST		
Vocabulary	( )	____________
Literature	( )	____________
Music	( )	____________
Social Studies	( )	____________
Mathematics	( )	____________
Physical Science	( )	____________
Biological Science	( )	____________
ABILITY TEST		
Total English	( )	____________
Reading Comprehension	( )	____________
Creativity	( )	____________
Mechanical Reasoning	( )	____________
Visualization in 3D	( )	____________
Abstract Reasoning	( )	____________
Arithmetic Reasoning	( )	____________
Introductory Math	( )	____________
Arithmetic Computation	( )	____________
OTHER VARIABLES		
Socioeconomic Status	( )	____________
H.S. Courses Taken (Aca.)	( )	____________
H.S. Grades	( )	____________
Amt. of Extracur. Reading	( )	____________
Study Habits & Attitudes	( )	____________

Table 1

LIST OF THE OCCUPATIONS INCLUDED IN EACH OF THE 12 CAREER GROUPS IN THE CAREER DATA BOOK

1. Engineering, Physical Science, Mathematics, and Architecture

- Architect (A)
- Chemist (B)
- Engineer (n.e.c.)* (C)
  - Aerospace (D)
  - Chemical (E)
  - Civil, Hydraulic (F)
  - Electrical, Electronic (G)
  - Mechanical, Automotive (H)
- Geologist (I)
- Mathematician, Statistician (J)
  - College Mathematics Teacher (K)
  - High School Mathematics Teacher (Females) (m)
- Physical Scientist (n.e.c.) (N)
- Physicist (O)
- Science Teachers
  - College Science Teacher (P)
  - High School Science Teacher (R)

2. Medical and Biological Sciences

- Agricultural Specialist (A)
- Biologist, Zoologist (B)
- Dentist (C)
- Nurse (Females) (d)
- Pharmacist (E)
- Physician (F)
- Veterinarian (G)
- Wildlife/Conservation Specialist (H)

3. Business Administration

- Accountant, Auditor, Comptroller (A)
- Advertising Worker (B)
- Business Administration and Management (n.e.c.) (C)
- Certified Public Accountant (D)
- Efficiency Expert, Industrial Engineer, Production Manager (n.e.c.) (E)
- Finance Worker (F)
- Industry, Business, Commerce (n.e.c.) (G)
- Investment Consultant (H)
- Manufacturing Management (I)
- Marketing and Wholesale/Retail Trade Manager (J)
- Military Officer (K)
- Personnel Administrator (L)
- Pilot (M)
- Purchasing Agent (N)
- Retail Buyer (Females) (r)
- Stockbroker (S)
- Teacher - Commercial Education (Females) (t)

4. General Teaching and Social Service

- Clergyman (A)
- Guidance
  - Counseling (Females) (b)
  - Vocational/Educational (Females) (d)
- Social Worker (Females) (e)
- Teacher (n.e.c.) (Females) (f)
  - Elementary (Females) (g)
  - High School (Females) (h)
  - Preschool (Females) (i)
  - Specialists
    - Handicapped (Females) (j)
    - Home Economics (Females) (k)
    - Physical Education (Females) (l)

5. Humanities, Law, Social and Behavioral Sciences

- Diplomat (A)
- Economist (B)
- Journalist, Reporter (C)
- Lawyer (D)
- Librarian (Females) (e)
- Psychologist (F)
- Social Scientist (G)
- Teacher
  - College (n.e.c.) (H)
  - English
    - College (Females) (i)
    - High School (Females) (j)
  - Foreign Language
    - College (Females) (k)
    - High School (Females) (l)
  - Social Sciences and Studies
    - College (M)
    - High School (N)
- Writer (Females) (r)

6. Fine Arts, Performing Arts

- Artist/Painter, Sculptor, etc. (Females) (a)
- Commercial Artist/Advertising, Fashion, Illustrator, etc. (B)
- Musician/Instrumentalist (C)
- Teacher
  - Art (Females) (d)
  - Music (Females) (e)
- Theater Worker (F)

7. Technical Jobs

- Computer
  - EAM Operator, Supervisor (A)
  - Programmer (B)
  - Repair Serviceman (C)
- Dental Hygienist (Females) (d)
- Draftsman (E)
- Electronics
  - Technician (F)
  - Worker (n.e.c.) (G)
- Laboratory Technician
  - Biological Science, Dental, Medical (Females) (h)
  - Physical Science, Engineering, etc. (I)
- Photographer (J)
- Physical Therapist (Physiotherapist) (Females) (k)
- Specialized Therapist (Miscellaneous) (Females) (m)
- Surveyor (N)
- Technologist/Medical, Dental (Females) (r)

8. Proprietors, Sales

- Clerk/Sales (Females) (a)
- Farming/Ranching - Owner (B)
- Manager/Sales (C)
- Proprietor, Contractor (in business for self) (D)
- Salesman
  - Auto (E)
  - Insurance (F)
  - Other (n.e.c.) (G)
  - Real Estate (H)
- Supervisor/Business (I)

9. Mechanics, Industrial Trades

- Clothing, Fashion Trades (Females) (a)
- Electrician (n.e.c.) (B)
- Machinist (C)
- Mechanic
  - Airplane (D)
  - Auto (E)
  - Other (n.e.c.) (F)
- Metal Worker (G)
- Printing Tradesman (H)
- Repairman
  - Appliance (I)
  - Industrial Machine (J)
  - Office Machine (K)
  - Telephone (including installers) (L)

10. Construction Trades

- Bricklayer, Mason, Painter, Roofer, Plasterer, etc. (A)
- Building Construction/Miscellaneous (B)
- Carpenter (C)
- Foreman (n.e.c.) (D)
- Heavy Equipment Operator (E)
- Mining, Quarrying, etc. (F)
- Plumber, Pipefitter (G)

11. Secretarial-Clerical, Office Workers

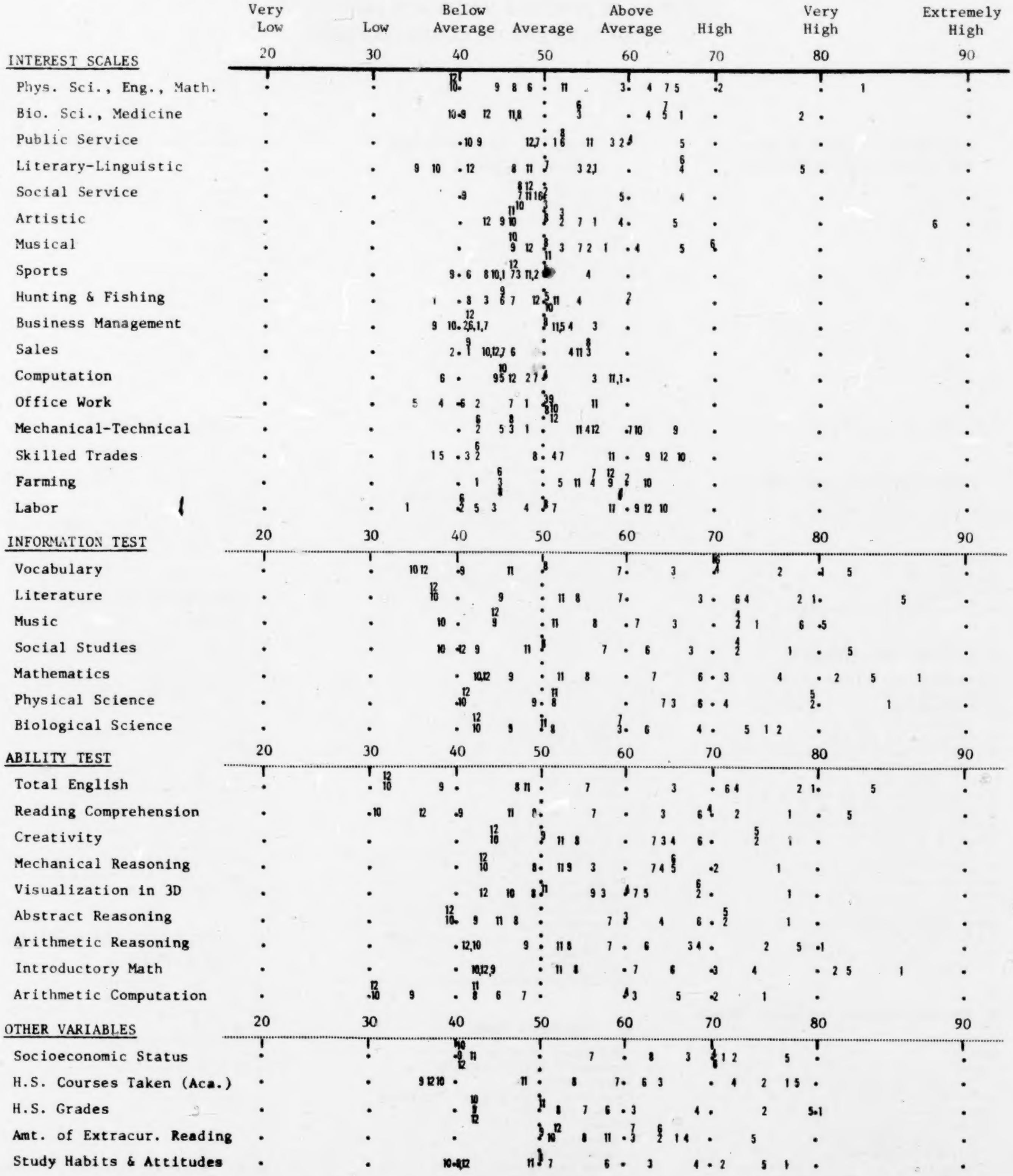
- Account Recording Worker/Miscellaneous (Females) (a)
- Bookkeeper (Females) (b)
- Clerical Worker/Miscellaneous (C)
- Clerk
  - Bank (D)
  - Miscellaneous (Females) (e)
- Operator
  - Keypunch (Females) (f)
  - Radio, Telegraph, and Teletype (G)
  - Telephone (PBX) (Females) (h)
- Receptionist, Hotel Clerk, etc. (Females) (i)
- Secretary (n.e.c.) (Females) (j)
  - Legal (Females) (k)
  - Medical (Females) (l)
- Stenographer, etc. (Females) (m)
- Typist (Females) (n)

12. General Labor, Community and Public Service

- Butcher, Meat Cutter (A)
- Driver - Auto, Bus, Truck (B)
- Farming/Ranching - Other (n.e.c.) (C)
- Fireman (D)
- Hairdresser (Females) (e)
- Laborer/General (F)
- Military/Enlisted (G)
- Nurse/Practical (Females) (h)
- Policeman (I)

*n.e.c. means "not elsewhere classified"

MEAN PERCENTILE RANKINGS FOR STUDENTS IN TWELVE CAREER GROUPS*



*The twelve Career Groups are represented on this chart by their numbers as given in Table 1 on page 3 of the Student's Booklet. For example, five years after their graduation from high school, students who were planning a career in Business Administration (Career Group 3) had a mean vocabulary score (on Information Test) close to a percentile ranking of 65 among students who were in grades 10, 11, and 12 in 1960. These results are based on replies from more than 108,000 students.

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